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Wecker

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UNITED STATES DISTRICT COURT

EASTERN DISTRICT OF NEW YORK

ROBERT A. FALISE, et al., )

Plaintiffs, )

vs. )

) No. 97 CV 7640 (JBW)

THE AMERICAN TOBACCO COMPANY, )  
et al., )

Defendants. )

**COPY**

DEPOSITION OF WILLIAM E. WECKER, Ph.D.

San Francisco, California

Wednesday, December 13, 2000

Reported by:  
GINA GLANTZ  
CSR No. 9795  
JOB No. 116379

  
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UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF NEW YORK

ROBERT A. FALISE, et al.,

Plaintiffs,

vs.

THE AMERICAN TOBACCO COMPANY,  
et al.,

Defendants.

No. 97 CV 7640 (JBW)

in

Deposition of WILLIAM E. WECKER, Ph.D.,  
taken on behalf of Plaintiffs, at 400 Sansome  
Street, Second Floor, San Francisco,  
California, beginning at 2:15 p.m. and ending  
at 8:45 p.m., on Wednesday, December 13, 2000,  
before GINA GLANTZ, Certified Shorthand  
Reporter No. 9795.

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(Video teleconference appearance.)

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(Video teleconference appearance.)

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1 APPEARANCES (Continued):

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3 WILLIAM E. WECKER, Ph.D.

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10 William E. Wecker, Ph.D., In Response to  
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2\*\* Article from the American Journal of Public 17  
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13 Trial for Smoking Cessation (COMMIT): I.  
Cohort Results from a Four-Year Community  
Intervention"

13

15

3\*\* Article from the journal Tobacco Control 17  
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16 in a Cohort of Adult Smokers Followed for  
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4\* Document entitled "Monograph 6" 19

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6 One-page letter dated December 12, 2000, to 38  
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\* Retained by the witness.

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\*\* Originals retained by the witness.

# Wecker

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Wecker

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1 San Francisco, California, Wednesday, December 13, 2000

2 2:15 p.m. - 8:45 p.m.

3

4

THE VIDEOGRAPHER: Good afternoon. Here begins  
5 Videotape No. 1, Volume 1, in the deposition of William  
6 Wecker, in the matter of Falise versus American Tobacco,  
7 in the U.S. District Court, Eastern District of  
8 New York, the case number of which is 97 CV 7640 (JBW).  
9 Today's date is 12-13-2000. The time on the monitor is  
10 2:16 p.m.

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This deposition is being taken at 400 Sansome  
Street, on the second floor, in San Francisco  
California. The videographer is Paul Husome, employed  
by Esquire Deposition Services, located at 505 Sansome  
Street, Suite 502, in San Francisco, California.

Would counsel present and also present on the  
video teleconference please identify yourselves and  
state whom you represent.

MR. MINTON: Michael Minton, I'm with the firm  
of Thompson Coburn, and I represent Lorillard Tobacco  
Company.

MR. CHANG: Michael Chang, I'm a paralegal with  
Orrick, Herrington & Sutcliffe.

MR. FORESTA: In New York, this is Stephen

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Wecker

8

1 Foresta from the firm of Orrick Herrington & Sutcliffe.

2 I represent the Falise plaintiffs in this matter.

3 MR. BURTON: Dal Burton, with Womble Carlyle.

4 I represent R.J. Reynolds Tobacco Company.

5 MR. UGARTE: Richard Ugarte, from Winston &  
6 Strawn, representing Philip Morris.

7 MR. FORESTA: Anyone else?

EXAMINATION

8  
9 BY MR. FORESTA:

10 Q All right. Sir, could you please state your  
11 full name for the record.

12 THE REPORTER: I need to swear the witness.

13 THE VIDEOGRAPHER: Thank you. Would the court  
14 reporter please swear in the witness.

15  
16 WILLIAM E. WECKER, Ph.D.,  
17 having been first duly sworn, was examined and testified  
18 as follows:

19  
20 THE REPORTER: Go ahead.

21 THE WITNESS: William E. Wecker.

22 BY MR. FORESTA:

23 Q Thank you. And what is your address, sir?

24 A 505 San Marin Drive in Novato, California.

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Wecker

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1 Q Is that a home address or business address?

2 A That's a business address.

3 Q Dr. Wecker, present in San Francisco with you  
4 is a legal assistant from our firm by the name of  
5 Michael Chang. What I'm going to try and do is have --  
6 coordinate with Mr. Chang in presenting you with some  
7 deposition exhibits. Hopefully this will work out, but  
8 in the event that we have some glitches, please bear  
9 with us.

10 First thing I'd like to do is have Mr. Chang  
11 give to the court reporter the "Report of William E.  
12 Wecker, Ph.D., in Response to Dr. Cummings's September  
13 22, 2000 Supplemental Report," and have that marked as  
14 Exhibit 1 by the court reporter, please.

15 (Deposition Exhibit 1 was marked for  
16 identification by the court reporter.)

17 BY MR. FORESTA:

18 Q Can you identify the document for the record,  
19 please.

20 A This is my report, as described in the caption,  
21 in this case.

22 Q Thank you. I know that you've been deposed  
23 before in this litigation, Dr. Wecker, but the purpose  
24 of today's deposition is to question you with respect to

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1 any opinions that you formulated as set forth in this  
2 supplemental report. Do you understand that?

3 A Yes.

4 Q All right. Did you prepare this report marked  
5 as Exhibit No. 1?

6 A Yes.

7 Q Did you have any assistance in preparing the  
8 report?

9 A Are you -- is your question limited to the  
10 document or do you intend to include the work that the  
11 document describes?

12 Q I want to start first with the paper report,  
13 the document itself.

14 A Well, I can tell you that I wrote the document,  
15 and I did it on my own word processor, and I believe I  
16 actually punched the print key, but since there were  
17 some other people involved, I -- I can just give you  
18 that best recollection. The words are mine. I typed  
19 them in with my fingers. Is that close enough?

20 Q When you say "other people" were involved,  
21 you're not including people involved in the actual  
22 drafting of this report; is that correct?

23 A If by that you mean the words on the page here  
24 as opposed to the work product, then I will tell you

1 that those are my words and no one else's.

2 Q Okay. Dr. Wecker, were you asked by counsel to  
3 prepare this report?

4 A Yes.

5 Q And which counsel?

6 A I think it was Mr. Leibenstein.

7 Q When were you asked to prepare this report?

8 A I can tell you, when Mr. Leibenstein called and  
9 either he said that a report would be involved or I took  
10 it for granted at that time, the date of that call was  
11 November 14th.

12 Q Did you begin the process of preparing this  
13 report on November 14th?

14 A No, the actual report writing came later.

15 Q Fair enough. At the time that Mr. Leibenstein  
16 called you to discuss the preparation of this report,  
17 did you have Dr. Cummings' September 22nd, 2000  
18 supplemental report in your possession?

19 A Just a moment while I check something. I was  
20 checking to refresh my recollection, and what I'm  
21 recalling now, by looking at the actual document, is  
22 that the Cummings report is dated September 22nd, and I  
23 believe I received that report very close to September  
24 22nd.

1 Q Who did you receive it from?

2 A I'm not sure. It would come in, probably, a  
3 Federal Express envelope, but I didn't open the  
4 envelope. I take it it came from counsel, but I didn't  
5 actually receive the envelope.

6 Q Somebody else in your office would have opened  
7 it?

8 A Yes, a clerical person; one of a couple who  
9 would deal with our incoming mail would have opened it.

10 Q Do you recall the first time that you saw this  
11 Cummings supplemental report?

12 A I can't give you a sharp date. I believe it  
13 was shortly after September 22nd.

14 Q Did the Cummings supplemental report come with  
15 a cover letter describing what it was?

16 A There were some other materials that came. I  
17 don't remember -- there could well have been a cover  
18 letter, but I don't have any recollection of one, but  
19 there were probably 6 or 8 inches of other materials  
20 that came. I don't remember if they all came at the  
21 same time or in batches. That's -- and I didn't bring  
22 them with me, so I can't do much better on that.

23 Q Can you describe what the other materials were  
24 that were provided to you?



1 A Mainly materials relating to the COMMIT work,  
2 documentation and research-type materials as opposed to  
3 lawyer-type materials.

4 Q You said that the packet of material was about  
5 6 inches thick?

6 A That's my recollection. I'm sorry I didn't  
7 bring them. I just assumed that you would know about  
8 that, but if you -- if you want, during a break, I can  
9 call and get an inventory of that package. I just  
10 didn't bring it because I didn't think I needed to.

11 Q I'd like to do that, unless I can get an answer  
12 from counsel that obviates the need for that. But we  
13 don't have to take care of that right now.

14 A Okay. I'll wait for you to ask on that, then.

15 MR. UGARTE: Frank, for the record --

16 MR. FORESTA: Steve.

17 MR. UGARTE: Steve, I'm sorry. Steve, I can  
18 explain for the record, if you'd like.

19 MR. FORESTA: Please.

20 MR. UGARTE: The materials that Dr. Wecker is  
21 referring to are more than likely the reliance materials  
22 that were submitted to us by Michael Stolper after the  
23 report was written, to the best of my recollection.

24 MR. FORESTA: Okay. Thank you.

1 Q Did this initial communication, which included  
2 the Dr. Cummings supplemental report, include any  
3 instructions or directions on what you should do with  
4 it?

5 A No.

6 Q First time you had a communication with counsel  
7 for the tobacco companies on this matter was, I believe  
8 you said, on November 14th; is that correct?

9 A That's what I jotted down here. That was my  
10 recollection of that date. I've written it on my report  
11 here, because I thought you might ask me that, so that  
12 date I'm pretty sure of. I'm not sure of the exact date  
13 those other materials arrived.

14 Q Why don't you tell me, Dr. Wecker, what you did  
15 in response to the phone call from Mr. Leibenstein in  
16 preparing this report. And now I'm referring more  
17 broadly to any work product that you did in connection  
18 with this assignment.

19 A Sure.

20 MR. MINTON: Object to the form of the question

21 THE WITNESS: What I did is review the Cummings  
22 report, and -- I actually looked, sometimes only  
23 briefly, at everything I received, but I'm going to pick  
24 on the things that I paid the most attention to. The

1 Cummings report I think I already had, or possibly they  
2 came again in the stack. But I know I already had in my  
3 possession, from earlier work, the two articles that  
4 I've brought here with me, which I will refer to, if  
5 it's all right, as the 1995 COMMIT article and the 1997  
6 COMMIT article. Would you like me to give the titles of  
7 those?

8 BY MR. FORESTA:

9 Q Yes, sir.

10 A Okay, the 1995 one is from Journal -- the  
11 American Journal of Public Health. And the title is  
12 "Community Intervention Trial for Smoking Cessation  
13 (COMMIT)," and then it has a Roman numeral I and says,  
14 "Cohort Results From a Four-Year Community  
15 Intervention." That's dated February of 1995. And  
16 that's the one I mean when I refer to the 1995 article.  
17 And the 1997 article has the title "Predictors of  
18 Smoking Cessation in a Cohort of Adult Smokers followed  
19 for Five Years." And it's in a journal called Tobacco  
20 Control. Is that enough description?

21 Q Yes, it is. Do you have any opposition, sir,  
22 to having us mark those two reports as exhibits for this  
23 deposition?

24 A No, you're welcome to them. You want me to

1 have the court reporter do that now or we'll do it later  
2 or what?

3 Q We have copies ourselves, but if it's not a  
4 problem for you, I'd prefer to mark that version.

5 A Okay. So you want me to just -- since you're  
6 at a distance there, I'll try to help out on this end.

7 Q Please do. If you could take the '95 report,  
8 and we'll have the court reporter mark that as Exhibit  
9 2.

10 MR. UGARTE: For the record, I would ask just  
11 to make sure that those are clean copies of the  
12 articles, and complete copies, since I don't have the  
13 benefit of looking at the articles.

14 THE WITNESS: They're not clean copies. I've  
15 got a couple notes and arrows on them. And I believe  
16 they're complete, but I can give you the page numbers.  
17 The 9- --

18 BY MR. FORESTA:

19 Q Yeah, why don't you just tell us what the start  
20 page and the end page is.

21 A The 1995 article begins page 183 and ends 192.  
22 And the '97 article, I recall the page numbers are odd  
23 in this '97 article. I see no page number on the title  
24 page, and I have marked them myself because they're not

1 always legible. The last page -- I see one. It says  
2 S62, is the page number on the last page.

3 Q Okay.

4 A And the other pages begin with S. And they're  
5 sometimes marked in my own handwriting.

6 Q Those versions are as complete as the versions  
7 that I have here, and I see no reason why we shouldn't  
8 be entitled to a copy of a marked-up version that's in  
9 the doctor's possession. So I'd like to have you take  
10 those out and provide the '95 report to the court  
11 reporter to mark as Exhibit 2, and the '97 report to be  
12 marked as Exhibit 3.

13 MR. MINTON: What I'd like to do, Steve, is  
14 have an agreement that we can then substitute, at the  
15 conclusion of the deposition, a Xerox copy of the  
16 exhibit so that the doctor can have his originals back.

17 MR. FORESTA: Fair enough.

18 MR. MINTON: Okay.

19 (Deposition Exhibits 2 and 3 were marked  
20 for identification by the court reporter.)

21 THE WITNESS: Okay, we've done that.

22 BY MR. FORESTA:

23 Q Thank you, sir.

24 Now, I believe you said that you would have

1 read Dr. Cummings' supplemental report, and you would  
2 have read these two articles which you believe you may  
3 already have had in your possession.

4 What else did you do following  
5 Mr. Leibenstein's conversation with you in November of  
6 this year?

7 A Okay, I also reviewed Monograph 6, which you  
8 probably know by that name, it's a thick document. And  
9 I --

10 Q Doctor, before you continue, pardon the  
11 interruption, do you have the full copy of the Monograph  
12 No. 6?

13 A Well, I think so. It begins with a title page  
14 that says "Monograph 6," and my last page is -- well, my  
15 last page looks like some kind of a computer-type thing.  
16 It says the letters HV, "Community based 5740," and so  
17 on. I'm not sure what that's all about. But then the  
18 last substantive page is 252.

19 MR. FORESTA: Okay. Again, I'd like to have  
20 that document handed to the court reporter to be marked  
21 as Exhibit No. 4. We can make a photocopy of that and  
22 provide you with the original back at the end of the  
23 deposition.

24 MR. MINTON: All right.

1 (Deposition Exhibit 4 was marked for  
2 identification by the court reporter.)

3 THE WITNESS: Let me look, and if I have no  
4 marks here, you might not need it to be copied. Let me  
5 just look for a second. I see no notations on this of  
6 mine. Somebody else has written this letter "HV  
7 7406" -- sorry, "C 737 1995 C2," but that's not my  
8 handwriting, it came that way. So if you're  
9 comfortable, so that we don't have to copy this thick  
10 thing, you may actually have a copy of this, and we  
11 don't need to do it. How's that?

12 BY MR. FORESTA:

13 Q I have the actual book. I don't know if you  
14 can see this. I have a photocopy. We don't need  
15 another one for the record, if counsel doesn't have a  
16 problem with that. And on your representation that  
17 there aren't any markups on the version that you  
18 considered and you reviewed, we'll just work off of what  
19 we have.

20 MR. MINTON: Would you like Mr. Chang to have a  
21 quick look at it?

22 MR. FORESTA: You know what? He doesn't need  
23 to do that. I'll take the doctor's word for it.

24 MR. MINTON: All right.

1 BY MR. FORESTA:

2 Q All right, please continue with a description  
3 of what you did subsequent to the phone call from  
4 Mr. Leibenstein.

5 A Well, I've indicated the paper documents that I  
6 paid the most attention to, and then there were two  
7 computer CDs with data, and I downloaded that data from  
8 the CDs, and just for a name to call all that data,  
9 we'll call that the COMMIT data, because it's data that  
10 comes from that study. Then I analyzed that data, and I  
11 think that sums it up. Then I wrote up what I found in  
12 this very brief report.

13 Q Getting back for a second to the computer data  
14 that you received, you received that from counsel for  
15 the tobacco companies?

16 A I assume so. That's -- I would normally expect  
17 to get everything by way of counsel. But my  
18 understanding is that it's material that came from  
19 Dr. Cummings indirectly.

20 Q That's fine.

21 A Indirectly through counsel.

22 Q Excuse me. I just wanted to make sure that  
23 this wasn't information that you also previously had  
24 possession of.



1 A You are correct. This came recently in the --  
2 from counsel indirectly. My understanding was it was  
3 provided by Cummings. And I got it for the very first  
4 time. I have never been able to get my hands on COMMIT  
5 data prior to this matter.

6 Q Okay. And obviously, prior to this matter, you  
7 haven't had an opportunity to analyze the COMMIT data;  
8 correct?

9 A That's correct, I have not had it.

10 Q All right. What did you do after you analyzed  
11 the data, Sir?

12 A Well, then I think we're essentially up to the  
13 report-writing stage. This was a very compressed time  
14 period, so now we have a December 4th dated report by  
15 me, and I was writing on that a day or two before, and I  
16 simply describe what I did.

17 Q Who, if anyone, assisted you in the analysis of  
18 the data that was provided to you?

19 A Mr. Harvey. And then he had some other people  
20 that were assisting him, and since that's at a second  
21 level, I'm not as sure of who he was getting help from,  
22 but mainly I worked directly with Mr. Harvey.

23 Q For the record, who is Mr. Harvey?

24 A He's a gentleman that works at my firm.

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1 Q First name?

2 A Gary. I believe it's R., the initial R., then  
3 Garrison Harvey. Goes by Gary.

4 Q All right. Did he do -- strike that question.

5 Did you do any of the analysis of the data or  
6 was that done by Mr. Harvey and people working at  
7 Mr. Harvey's direction?

8 A They were all working at my direction, and I --  
9 they would -- he -- and sometimes he would bring other  
10 folks that were helping him to my office, and we would  
11 discuss what to do, and then normally I'd have him go  
12 off and do it, or maybe he would assign bits of the work  
13 to other people and then come back with results.

14 Q Did you ever do the actual computations, the  
15 statistical computations yourself?

16 A I did some of my own, but mainly the larger  
17 computer runs were done by other people. This was a  
18 very compressed time period, so we probably had -- I  
19 think there was as many as four people that were working  
20 on this at the same time.

21 Q Okay. Dr. Wecker, I noticed from the screen  
22 that you brought some materials with you here today?

23 A Yes, I've -- those are the ones that I  
24 mentioned as I was going through them.

1 Q Okay. Tell me again what it is that you  
2 brought with you here today.

3 A I've got my report, I've got the Cummings  
4 report, I've got the two articles, '95 and '97, I've got  
5 the Monograph 6, and the one I didn't mention is that I  
6 have the computer printout that -- I would call it my  
7 work papers that were disclosed to you, I don't know the  
8 exact date, but a few days ago. They would -- I think  
9 they would have been disclosed in computer form, but I  
10 have some printouts here of those.

11 MR. FORESTA: Okay. Mike, does it make sense  
12 to put an exhibit tab, an exhibit sticker on that  
13 binder, and maybe we can get a photocopy of the contents  
14 of the binder during a break?

15 MR. MINTON: Yes.

16 MR. FORESTA: Okay. Madam Court Reporter,  
17 could you put a sticker on the cover of that binder,  
18 please.

19 (Discussion off the record.)

20 THE REPORTER: Is this on the record?

21 MR. FORESTA: Let's go off the record, please.

22 THE VIDEOGRAPHER: The time is 2:40. We're  
23 going off the videotaped record.

24 (Discussion off the record.)

1 (Deposition Exhibit 5 was marked for  
2 identification by the court reporter.)

3 THE VIDEOGRAPHER: The time is 2:41. We're  
4 back on the videotaped record.

5 BY MR. FORESTA:

6 Q Dr. Wecker, can you tell me all of the  
7 materials that you considered in preparing your report,  
8 which has been marked as Exhibit 1 for this deposition?

9 MR. MINTON: Object to the form.

10 THE WITNESS: Well, I'm -- let me first  
11 incorporate, by reference, the materials that are cited  
12 in my report, rather than trying to just read them all.

13 BY MR. FORESTA:

14 Q Well, let me just stop you there, because the  
15 version of your report that I have says, "Attachment A,  
16 additional materials considered." And there are two  
17 items listed. One, K. Michael Cummings, Expert Report,  
18 Falise, et al., v. The American Tobacco Company, et al.,  
19 September 22, 2000." We've already discussed that;  
20 right, Dr. Wecker?

21 A Yes.

22 Q And the second item is "Data files collected  
23 from the COMMIT smoking cessation study." Have you --  
24 those are the computer files that you received from

1 counsel; is that correct?

2 A Yes, the ones we've discussed.

3 Q Okay. In addition to the Cummings report and  
4 the data files that we've already discussed, what other  
5 materials did you consider in preparation of Exhibit No.  
6 1?

7 A Okay, I'm going to -- I think the answer I  
8 started was going to be helpful. I can either take the  
9 time, if you want me to, or I can just tell you that  
10 throughout the report you'll find footnotes, 14 in  
11 total, and they mention various materials that I am  
12 referring to.

13 Q Right.

14 A And rather than just read them all, I would say  
15 those are things that I considered. And I was --

16 Q Fair enough.

17 A And I am going to take a moment to look here  
18 and see if there's anything else that comes to mind.

19 I mentioned earlier the stack of materials that  
20 I call the Cummings disclosures. I don't have them  
21 here, but I did look through them. I suppose it's fair  
22 to say I considered those. I'm -- just a moment, I'll  
23 continue here.

24 I looked at a summary description of the COMMIT

1 study that's in the 2000 surgeon general report. I  
2 can't point to the page, but there's about a two-page  
3 description in there that I read.

4 There's a document from the Centers for Disease  
5 Control that I looked at that talks about smoking  
6 cessation. I believe that's the title, at least the  
7 title of the section that I looked at, "Smoking  
8 Cessation," and that's where they review a number of  
9 different studies, including the COMMIT study. And I  
10 think that's it, although I'll mention that Section II  
11 of my report refers to Dr. Harris's work, but I didn't  
12 review that new for this work, I just already knew about  
13 it. I was referring back to it from earlier  
14 depositions.

15 Q Do you have the summary description of the  
16 COMMIT study that's contained in the 2000 surgeon  
17 general's report with you now?

18 A No, I don't.

19 Q Do you have the CDC document that you  
20 referenced with you now?

21 A No, I don't have that either.

22 Q Am I correct that neither one of those two  
23 documents is referenced as material that you considered  
24 in your report marked as Exhibit 1?

1 A That's correct. It's not mentioned. That's  
2 why I made sure to tell you.

3 Q I appreciate that, but were you aware that you  
4 were supposed to disclose in your expert report all of  
5 the materials that you considered in preparing this  
6 report?

7 MR. MINTON: Object to the form of the  
8 question.

9 THE WITNESS: I'm not sure what the rules are.  
10 I'm just telling you that I have read those other items.

11 BY MR. FORESTA:

12 Q Irrespective of what the rules are, did counsel  
13 tell you to disclose all of the materials that you  
14 considered in preparing this report?

15 MR. UGARTE: Objection.

16 THE WITNESS: I don't recall a specific  
17 conversation. Obviously I have an attachment here that  
18 indicates other materials considered, and that's --  
19 those were the ones that I had in mind on December 4th,  
20 but, nonetheless, I must tell you today that I have  
21 looked at those other things. Whether I wrote it down  
22 or not, I have looked at them.

23 BY MR. FORESTA:

24 Q Well, you haven't written them down, we know

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1 that; right, Dr. Wecker?

2 A They're not on my December 4 appendix list,  
3 right.

4 Q And you did consider them in preparing this  
5 report; correct?

6 A Actually, I looked at them after December 4, so  
7 they weren't part of my pre-December 4 consideration,  
8 but I've looked at them.

9 Q What other materials, if any, did you look at  
10 after the preparation of this report on December 4?

11 MR. UGARTE: Objection. Vague and ambiguous.

12 THE WITNESS: I'm thinking. Just a minute.

13 I can't think of any others, but if one comes  
14 to mind later, I'll try to tell you about it.

15 MR. FORESTA: Counsel, can you see to it that  
16 we get a copy of the CDC document that Dr. Wecker is  
17 referring to?

18 MR. MINTON: Yeah, we'll produce that to you.

19 MR. FORESTA: I don't think there's any need to  
20 produce the 2000 surgeon general's report.

21 MR. MINTON: Okay.

22 BY MR. FORESTA:

23 Q Dr. Wecker, there's nothing else that you can  
24 recall, as you sit here now, that you considered in

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1 preparing this report other than the materials you've  
2 already referenced; is that correct?

3 A Well, I'm thinking. I hope I don't miss  
4 something. Just a minute.

5 I can't think of anything else. I've referred  
6 to everything that comes to mind.

7 Q Does your consideration of the CDC document and  
8 the surgeon general's report from the year 2000 affect  
9 in any way the opinions that are set forth in Exhibit 1?

10 A The material that was descriptive in the 2000  
11 surgeon general report, I would say -- I'd put it in the  
12 category of background with no direct connection to any  
13 opinion, just a description of the study. The CDC  
14 document actually led me to do a calculation, which we  
15 sent to you only recently, and which I have here in my  
16 notebook of computer materials, under --

17 Q What calculation -- I'm sorry.

18 A I have it here. Go ahead. You want me to  
19 finish this?

20 Q Could you please finish your answer, sir.

21 A Okay. -- in my notebook of materials, under a  
22 tab 74. I mention the tab number because I believe the  
23 organization of the materials that we sent on to you,  
24 even though in computer form, was organized by -- with

1 that same kind of indexing, so that might help you find  
2 it.

3 Q All right. Well, we're going to get to the  
4 computer information that was provided to us in a few  
5 minutes, but let's set aside, for the time being, that  
6 reference to tab 74, but if you can just tell me what  
7 that calculation is that you ran following your review  
8 of the CDC document.

9 A It's a calculation of quit rates.

10 Q Based on what information?

11 A The COMMIT data.

12 Q Hadn't you already done that prior to December  
13 4th, Dr. Wecker?

14 A I've done a number of calculations of quit  
15 rates, but not this one.

16 Q What's different about this quit rate  
17 calculation than the ones that you did before?

18 A Well, this one is done the way the CDC  
19 recommends.

20 Q When did you perform this calculation, sir?

21 A I'd say it was early yesterday. I may be off  
22 by a few hours, but . . .

23 Q Why did you do this, Dr. Wecker?

24 A Because, I -- well, for two reasons. First, I

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1 had been -- I had noted all along that the COMMIT  
2 calculation of quit rates appeared to ignore what I'll  
3 call nonresponders. And when I thought about that  
4 later, I happened to be talking to a colleague about a  
5 completely different matter having nothing to do with  
6 litigation, and asked if he knew how other people  
7 handled that, and he directed me to the CDC document,  
8 which I then reviewed and did the calculation their way.

9 Q When you say "how other people handled it,"  
10 what are you referring to?

11 A The calculation of quit rates as done in the,  
12 let's say the 1995 article, when there are  
13 nonresponders.

14 Q What do you mean by "nonresponders,"  
15 Dr. Wecker?

16 A I mean that in this context, when individuals  
17 were contacted or contact was attempted, in 1993, after  
18 the intervention period, if the individuals could not be  
19 located or chose not to speak to the interviewers or  
20 otherwise would not give them information on whether  
21 they had quit smoking or whether they had continued,  
22 that group I'm calling nonresponders, because that's a  
23 conventional term and statistical talk.

24 Q And it's your testimony, Dr. Wecker, that the

1 '95 study appears to ignore nonresponders; is that  
2 correct?

3 A Yes. Well, they mention them, but they -- when  
4 it comes to the calculation, that's what happens, yes.

5 Q In any of your calculations prior to yesterday,  
6 did you take into account the missing data from the 1995  
7 study?

8 MR. MINTON: Object to the form of the  
9 question.

10 MR. UGARTE: Object.

11 THE WITNESS: I'd have to look through my  
12 entire set of calculations, but -- and I'll do that if  
13 you ask me to, but I can give you a quick recollection  
14 that I hope will be accurate and saves time. I believe  
15 that whenever I had missing data in the various  
16 calculations, I set that data aside in the same fashion  
17 that Dr. Cummings did when he did his calculations.

18 As we're going through -- I assume you'll ask  
19 me specifics about these other items; if we go through  
20 them, I see that there's a place where that was done  
21 differently, I'll remember and I'll tell you.

22 BY MR. FORESTA:

23 Q As always, Doctor, if there ever comes a time  
24 when you recall something that changes a previous

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1 answer, please feel free to do so.

2 When did you first become aware that there were  
3 nonresponders in the COMMIT study?

4 MR. UGARTE: Object to the form.

5 THE WITNESS: First time I -- well, I would  
6 have assumed it going in, but the first time I became  
7 aware of it was when I read about it in the 1995 article  
8 describing the study.

9 BY MR. FORESTA:

10 Q In what way does the method of calculating quit  
11 rates for the COMMIT study set forth in the CDC paper  
12 differ from the methods set forth in the '95 study, the  
13 actual article, which we marked as Exhibit No. 2?

14 A The essential difference is that it is in the  
15 denominator of the quit rate calculation, where, in the  
16 '95 article, the number in the denominator would be  
17 composed of the number of individuals who reported  
18 quitting, plus the number of individuals who were  
19 contacted and reported continuing smoking; whereas, the  
20 CDC recommendation is to include, in addition, the  
21 number of individuals who were in the study but were  
22 non -- not able to be contacted at the '93 follow-up.

23 Q Again, it's your opinion that the '95 study  
24 does not take into account information relating to the

1 nonresponders; correct?

2 A Well, they -- it's -- it is certainly  
3 mentioned, but when it comes to the calculation of quit  
4 rates, it's as if those numbers are simply set aside,  
5 they simply don't figure into the calculation.

6 Q They're not imputed into the calculations in  
7 any way?

8 MR. UGARTE: Objection.

9 BY MR. FORESTA:

10 Q Did you hear the question, sir?

11 A I didn't hear a full question.

12 Q They're not imputed into the calculations of  
13 quit rates in any way in the '95 studies?

14 A Well, that would almost be a semantic debate.  
15 I think the -- there's a discussion of imputations, and  
16 I certainly read it, that the plain fact of how the  
17 calculation is done is that the individuals who were not  
18 contacted are simply ignored. Anything that comes after  
19 that in the way of imputation discussion is simply a  
20 matter of trying to justify doing it that way, but it  
21 doesn't change the fact that that's how the calculation  
22 was done.

23 I wonder if you'll permit me, and we'll just  
24 leave the tape running for time, to just reach back and

1 get a glass of water.

2 Q Oh, certainly.

3 A Just one second.

4 Q Don't forget the mike.

5 A Okay, thank you. Okay. Ready.

6 Q All right, Dr. Wecker, did counsel request that  
7 you run new calculations based on the CDC information?

8 A No, that was just my idea.

9 Q Okay. When did you first communicate to  
10 counsel that you had done these new calculations?

11 A I think it was within a matter of an hour  
12 before sending them to you, so it would have been, I  
13 think, yesterday sometime.

14 Q Who did you communicate this back to?

15 A I'm not sure. I was in a meeting, and I asked  
16 Mr. Harvey to call, and so I'm not sure who actually got  
17 on the phone.

18 Q This meeting that you were in, did it have to  
19 do with the Falise matter, the Falise case?

20 A No, no. I had a long-scheduled meeting with  
21 other people yesterday, and so I had to try to do two  
22 things at once yesterday. The meeting had nothing to do  
23 with this matter.

24 Q Okay. Did you meet with counsel prior to the

1 deposition today, about this deposition?

2 A This morning or late this morning, not  
3 yesterday, because I was busy with another thing, but  
4 when I drove here this morning around -- around 11  
5 o'clock, I met with Mr. Minton, and we had lunch and  
6 then we came over here.

7 Q All right. Are you aware, Dr. Wecker, that  
8 Dr. Cummings was deposed in this matter on December 1st?

9 A I don't recall the date, but I am aware he was  
10 deposed.

11 Q Have you seen or reviewed the transcript from  
12 that deposition?

13 A Yes. And you have just named another document  
14 that I had forgotten. I have reviewed that deposition,  
15 although --

16 Q Well, did you --

17 A Excuse me. I reviewed it. I haven't read  
18 every page, but I spent some time looking at it.

19 Q Did you review that transcript prior to  
20 preparing your report marked as Exhibit 1?

21 A I'm not sure of that. I don't remember what  
22 date I got it, so I'm not sure when I first saw it.

23 Q All right. And you don't disclose that as a  
24 material that you considered in preparing this report,



1 do you?

2 A No, and that suggests that I might not have  
3 received it by that time.

4 Q All right. And did you receive any exhibits  
5 that were marked at Dr. Cummings' deposition in December  
6 of this year?

7 A Well, I'm not sure what was marked as an  
8 exhibit. I have that other stack of materials that I'm  
9 calling the disclosure materials. Whether those were  
10 marked or not, I'm not sure. I didn't pay attention to  
11 whether the stack of materials had exhibit stickers on  
12 them.

13 Q All right. Just to draw the distinction, when  
14 you received the transcript, presumably within the last  
15 two weeks, did you receive any exhibits or any documents  
16 along with the transcript that purport to be exhibits  
17 marked at the deposition?

18 A Well, not that I'm aware of. Perhaps I'm  
19 mixing them up, but the deposition that I looked at, I  
20 believe was sent by electronic e-mail, and I just  
21 printed it, so if the other --

22 Q Okay.

23 A -- if there were some other materials, I  
24 haven't associated them with the deposition.

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1 Q Did you discuss the Cummings deposition with  
2 counsel for the tobacco companies?

3 A Today I did, yes.

4 Q During your session this morning or early this  
5 afternoon with Mr. Minton?

6 A Yes.

7 Q Prior to that time, had you discussed the  
8 Cummings deposition with counsel?

9 A No.

10 Q Had you reviewed the Cummings deposition  
11 transcript prior to running these new calculations based  
12 on the CDC document?

13 A Yes.

14 Q Did the -- did your review of the Cummings  
15 deposition transcript cause you to run these new  
16 calculations?

17 A No.

18 MR. FORESTA: All right. Michael Chang, if  
19 you're there, if you could take the December 12th, 2000  
20 letter from Ricardo Ugarte to Chad Marlow and hand that  
21 to the court reporter to be marked as our next exhibit,  
22 please.

23 (Deposition Exhibit 6 was marked for  
24 identification by the court reporter.)

1 THE WITNESS: Do you know if this thing  
2 receives regular TV signals?

3 MR. CHANG: I have no idea.

4 THE WITNESS: Well, at a break, find out so we  
5 can watch the thing at 6 o'clock.

6 BY MR. FORESTA:

7 Q Dr. Wecker, do you have the document that's  
8 been marked as Exhibit 6?

9 A Yes, I do.

10 Q Okay. Just so we're working on the same page,  
11 literally, is this a one-page document on Winston &  
12 Strawn letterhead?

13 A Yes.

14 Q Okay. I will represent to you, Dr. Wecker,  
15 that this document, which is a letter from Mr. Ugarte to  
16 an associate of mine, Chad Marlow, and says, "Dear Chad:  
17 In connection with Dr. Wecker's upcoming testimony,  
18 attached please find a disk containing COMMIT reliance  
19 data," I will represent to you, sir, that this document  
20 and the accompanying disk were received in our offices  
21 sometime late yesterday afternoon/early yesterday  
22 evening. Recognizing that you didn't prepare this  
23 letter, do you, nevertheless, have any understanding as  
24 to what was contained on the disk that was referred to

1 by Mr. Ugarte as COMMIT reliance data?

2 MR. MINTON: Object to the form.

3 THE WITNESS: I can take a guess, that it was  
4 the material in my tab 74 and 75. If you -- if the disk  
5 had a directory and if the directory structure is the  
6 way I think it is, it probably has tab numbers on it.

7 BY MR. FORESTA:

8 Q Well, I have in front of me a print screen that  
9 I believe is the directory from the floppy disk that was  
10 sent to us, and it doesn't make any reference to tabs.

11 There are four files listed here, the first of which is  
12 an LST file entitled "diff18a"; do you recognize that  
13 title?

14 A Yes.

15 Q The next one is a SAS file entitled  
16 "diff18a.sas."

17 A Yes.

18 Q Do you recognize that?

19 A Yes.

20 Q The third file is an LST file entitled  
21 "89eval"; do you recognize that?

22 A Yes.

23 Q And the last of the four files that were  
24 provided to us yesterday is another SAS file, this one

1 is entitled "89eval.sas." Do you recognize that one?

2 A Yes.

3 Q Is this the information, the computerized  
4 information that you provided to counsel yesterday?

5 A Yes.

6 Q Can you just summarize for the record what this  
7 information constitutes or represents?

8 A Sure. The -- there's two things here. The  
9 dot LST files are the output and the dot SAS files are  
10 the computer program that will create the output, so  
11 I'll refer to two things rather than four things.

12 Q Fine.

13 A The first one is the calculation of the quit  
14 rates in accordance with the CDC method, and then the  
15 second thing, which begins with the 89, is a tabulation  
16 of questionnaire results from the COMMIT data.

17 Q Did you say tabulation of questionnaire data?

18 A Yes, survey data.

19 Q Where did you get that information from, the  
20 information that went into the second calculation you  
21 just referred to?

22 A That's received from disclosures from your  
23 folks in this case. It's the -- came on the CDs.

24 Q That would have been included in the materials

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1 you received in September of this year; correct?

2 MR. UGARTE: Objection.

3 THE WITNESS: I don't remember if it was  
4 September or not, but anyway, it was earlier this year.

5 BY MR. FORESTA:

6 Q But it's your understanding or your belief that  
7 this data was included on the CDs that were provided to  
8 you by counsel for the tobacco companies; correct?

9 MR. UGARTE: Object to the form.

10 THE WITNESS: Yes, I believe that's correct.

11 BY MR. FORESTA:

12 Q All right.

13 A I don't want to confuse you with that answer.  
14 This is the same CDs that I talked about earlier that I  
15 believe originated with Dr. Cummings. It's not a  
16 different set of data.

17 Q Okay. Maybe I shouldn't have assumed that, but  
18 I did.

19 A Okay, good. I just want to make sure.

20 MR. FORESTA: Michael Chang, can you take the  
21 two-page document that you should have there with a  
22 handwritten number 1 circled in the upper right-hand  
23 corner.

24 (Deposition Exhibit 7 was marked for

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1 identification by the court reporter.)

2 MR. FORESTA: Can we have that marked as

3 Exhibit 7, please.

4 THE REPORTER: It's done.

5 MR. FORESTA: Thank you. And has it been shown  
6 to Dr. Wecker?

7 THE WITNESS: Yes, I have it.

8 BY MR. FORESTA:

9 Q Okay. Can you please take a look at what's  
10 been marked as Exhibit No. 7, and I'll ask you, when  
11 you've had a chance to look it over, whether you  
12 recognize the document.

13 A I recognize it.

14 Q Can you identify for the record what this is?

15 A This is the file diff18a.lst.

16 Q And what does this represent? This is the  
17 output for the quit rate calculations that you ran  
18 according to the CDC document; is that correct?

19 A That's correct.

20 Q The top line on this document, Dr. Wecker, says  
21 "Quit ratios for 1m smokers." Can you just identify for  
22 the record what "1m smokers" refers to?

23 A That's the nomenclature of the COMMIT study.

24 The "1m" means the light/moderate smokers.

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Records Act

1 Q Is this out- -- is this document a reflection  
2 of the output of only the nonresponders from the COMMIT  
3 study --

4 A No.

5 Q -- or does this include the entire population?

6 A It includes the people who responded and said  
7 they quit. It includes the people who responded and  
8 said they did not quit, and it includes the people who  
9 did not respond.

10 Q And is this the only calculation that you ran  
11 for this case that includes the full population, namely,  
12 those who quit and responded, those who didn't quit and  
13 responded, and those who didn't respond?

14 MR. MINTON: Object to the form.

15 THE WITNESS: Maybe when we go through here  
16 I'll spot something that I'll have to add to my answer,  
17 but when it comes to quit rates, in the -- of the kind  
18 that we're looking at here in Exhibit 7, I believe this  
19 is the only one that was done in this fashion. There  
20 are other calculations throughout my work where data  
21 from individuals is used, but it's really on a different  
22 subject. I don't think it's what you meant in your  
23 question. I think -- I understood you to mean when it  
24 comes to quit rates of this kind.



1 BY MR. FORESTA:

2 Q That's right. Those other studies, do they  
3 include data that relates to nonresponders in this  
4 study?

5 A Well, that's -- that's why I have to add some  
6 interpretation to your question. Rather than just make  
7 you rephrase it, I was trying to help.

8 The issue doesn't even come up, in the way I'm  
9 discussing it now, until 1993.

10 Q Correct.

11 A And there are some elements of data here that  
12 were taken from 1988 or '89, and they do figure in some  
13 of the work that I've done, but I think that's mixing  
14 together two things that you really didn't have in mind  
15 in your question, so I just wanted to put that as a  
16 footnote. So that's why I said when it comes to quit  
17 rates of the kind that we're looking at in Exhibit 7, I  
18 believe this is the only one of this kind.

19 Q I understand. Thank you for the clarification.

20 And just for the record, Dr. Wecker, the second  
21 heading on this -- on the first page of Exhibit 7 says  
22 "Quit ratios for h smokers." Could you just tell us  
23 what "h smokers" refers to?

24 A The "h" is for heavy.

1 Q And this is a, I believe you said nomenclature  
2 that was used in the COMMIT study --

3 A Yes.

4 Q -- to refer to heavy smokers; is that correct?

5 A That's correct.

6 Q Do you know what the criteria is for being  
7 classified as a heavy smoker under the COMMIT study?

8 A If you want to be sure, I could look it up, but  
9 my memory is it was 25 cigarettes a day, but I could be  
10 wrong about that. They tell us in the description, and  
11 if you want me to take the time, I could try to look  
12 that up.

13 Q That's fine. We're going to get into the  
14 description later on.

15 Michael Chang, could you please take the  
16 document that has a number 2 and it's circled on the  
17 right-hand -- upper right-hand corner of the first page,  
18 hand that to the court reporter, and we'll mark that as  
19 Exhibit 8, please.

20 (Deposition Exhibit 8 was marked for  
21 identification by the court reporter.)

22 THE REPORTER: It's marked.

23 MR. FORESTA: Could you hand it to Dr. Wecker,  
24 please.

1 THE WITNESS: I've got it.

2 MR. FORESTA: Thank you.

3 MR. BURTON: Is this Exhibit 8?

4 MR. UGARTE: Yeah.

5 BY MR. FORESTA:

6 Q Do you recognize this document, Dr. Wecker?

7 A Yes.

8 Q Can you identify it for the record, please.

9 A This is the file that I sent to you that has  
10 the name diff18a.sas.

11 Q Is there any significance to the title  
12 "diff18a.sas"?

13 A No, I didn't give it the title. One of the  
14 people helping me yesterday, when I was busy with other  
15 things, did. I have no idea why they picked that.

16 Q All right. Dr. Wecker, is this the program  
17 that you ran to come up with the output set forth in  
18 Exhibit 7?

19 A Right. You run Exhibit 8; you get Exhibit 7.

20 Q Did you run this program yourself, or did  
21 someone else run it for you?

22 A I had someone else do this while I was in  
23 another meeting, but I told them what to do.

24 Q And what data did you use in running this

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1 program?

2 A This would be the -- I think the variable name  
3 is, I think, status 93 or something like that. It is  
4 the data that is collected by the COMMIT study people,  
5 in early 1993, when they call up and they ask the people  
6 that they've been following up during the four-year  
7 period what their final disposition was. I think -- I  
8 remember the variable name, I don't remember the lone  
9 file name.

10 Q Is this the entire data set from the COMMIT  
11 study?

12 A Oh, no, no, of course not. This is -- it's  
13 what I just told you it was.

14 Q Okay. This is information that you believe was  
15 provided by counsel for the plaintiffs in this case to  
16 counsel for the tobacco companies and then sent to you?

17 A Yes.

18 Q All right.

19 Michael, could you please mark the document  
20 that has a number 3 circled in the upper right-hand  
21 corner as Exhibit 9, please.

22 (Deposition Exhibit 9 was marked for  
23 identification by the court reporter.)

24 BY MR. FORESTA:

1 Q Do you have a copy of what's been marked as  
2 Exhibit No. 9, Dr. Wecker?

3 A Yes, I do.

4 Q Have you had a chance to take a look at that,  
5 please.

6 A Yes, I've seen it.

7 Q Do you recognize that document?

8 A Yes.

9 Q Would you please tell us for the record what it  
10 is.

11 A It's -- let me just check the full document.  
12 One second.

13 It appears to be a printout of my file  
14 89eval.lst.

15 Q And again, this is a file that you provided to  
16 counsel for the tobacco companies for the first time  
17 yesterday?

18 A That's right.

19 Q What does Exhibit 9 reflect? What's the  
20 information that's printed out here?

21 A It's just a tabulation of the questionnaire  
22 responses to one of the COMMIT questionnaire drafts, and  
23 the -- I've indicated question numbers, but if you'll  
24 permit me, I can suggest something here that might make

1 this easier to digest.

2 Q Please do, sir.

3 A Okay. First, you probably should print this  
4 out again with -- and do it landscape, because you've  
5 run the -- what is a single row, and it's wrapped around  
6 into double rows, and it's going to make it hard for you  
7 to read.

8 Q All right.

9 A And if you did that -- and then I have in  
10 Exhibit 5, in tab 75, following the material which is  
11 Exhibit 9, although I printed it out in a way that's  
12 easier to read, that I recommend -- following that, I  
13 have actually copied the questionnaires from the COMMIT  
14 documentation so that you can actually see what the  
15 questions are that I'm tabulating here.

16 Q Am I correct that the questions you're  
17 tabulating are questions numbered 23, 24, 26, 29, and  
18 30?

19 A Yes.

20 Q What was your purpose in tabulating these  
21 questions?

22 A Counsel just asked me to do it, and it was easy  
23 to do, and I was glad to do it.

24 Q When you say "counsel," who are you referring

1 to?

2 A I didn't actually take the call, but I believe  
3 that it was Mr. Ugarte.

4 Q When was the request made?

5 A I could be wrong about who called. I didn't  
6 take the call, and so let me help with the timing  
7 question. It would have either been yesterday morning  
8 or maybe sometime late the day before.

9 Q And you had not run these tabulations prior to  
10 that point in time; isn't that correct, Dr. --

11 A That is true.

12 Q Did counsel -- strike that question.

13 THE REPORTER: This is the reporter. Can I ask  
14 whoever is objecting to look right into the camera, or  
15 raise your hand, I can't -- it's very hard to tell who  
16 is talking.

17 MR. FORESTA: I objected.

18 THE REPORTER: Who was "I"?

19 MR. FORESTA: I struck the question. Nobody  
20 objected.

21 THE REPORTER: Okay. Well, when you do. Thank  
22 you.

23 MR. FORESTA: Michael Chang, can you take the  
24 document that has the number 4 in handwriting, circled

1 in the upper right-hand corner, give that to the court  
2 reporter, please.

3 (Deposition Exhibit 10 was marked for  
4 identification by the court reporter.)

5 BY MR. FORESTA:

6 Q Have you had a chance to look this over,  
7 Dr. Wecker?

8 A Yes, but just a moment. Okay.

9 Q Is there any better way to format this  
10 document?

11 A No, this is fine. You should have no trouble  
12 with this.

13 Q All right. Can you -- you recognize the  
14 document?

15 A Yes.

16 Q And can you identify it for the record, please.

17 A This is the file 89eval.sas.

18 Q And is this the program that you ran to do the  
19 tabulations requested by counsel?

20 A Yes.

21 Q And where did the data come from that you used  
22 in running this program?

23 A It came to me on those CDs that we talked about  
24 earlier.

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1 Q And what were the results of the tabulations  
2 that you ran?

3 A That's Exhibit 7. I'm sorry, Exhibit 9.

4 Q Dr. Wecker, the electronic data that we  
5 received yesterday is the second set of electronic data  
6 that we received in this case. I'll represent that to  
7 you.

8 Have you provided, on two separate occasions,  
9 computerized data or electronic data to counsel for the  
10 tobacco companies?

11 A Are you referring to disclosures in earlier  
12 depositions? I'm not sure I follow you.

13 Q No, no. You raise a good point. My questions  
14 on this topic relate solely to any disclosures you would  
15 have made in the course of preparing your supplemental  
16 report, which has been marked as Exhibit 1.

17 On how many separate occasions did you provide  
18 electronic data to counsel for the tobacco companies?

19 A Well, I think that the materials that I have  
20 here as tab 65 through 73 should have gone to about the  
21 time of -- or perhaps even the same day as my report,  
22 which is dated December 4th. Now, that, plus the ones  
23 we've just been discussing, are all that I can think of  
24 that are involved in the work related to my December 4

1 report.

2 Q Just so we're -- you understand me, when I say  
3 "you," I would also include anybody acting on your  
4 behalf; all right?

5 A Sure.

6 Q Okay. Did you provide the electronic data --  
7 the first set of electronic data to counsel for the  
8 tobacco companies along with your December 4th report?

9 MR. UGARTE: Objection.

10 BY MR. FORESTA:

11 Q In other words, did they go together from you  
12 to counsel for the tobacco companies?

13 A Probably not, but I remember signing, fairly  
14 late at night, the report of December 4th, but I -- I  
15 didn't actually see things go in a package, and so I  
16 don't know if there were computer materials in the  
17 package with this or whether they went separately.  
18 After I signed it, I handed it to somebody and I left.

19 Q Okay. You don't have any understanding that  
20 electronic data generated by you in the course of  
21 preparing your supplemental report was forwarded to  
22 counsel for the tobacco companies prior to completion of  
23 your report?

24 A It could have been, but I would expect it would

1 be around the same time.

2 MR. FORESTA: Michael Chang, can you take those  
3 series of print screens and provide them to the court  
4 reporter to be marked as Exhibit No. 11.

5 (Deposition Exhibit 11 was marked for  
6 identification by the court reporter.)

7 BY MR. FORESTA:

8 Q Dr. Wecker, I'll represent to you that I had  
9 someone in our MIS department print out for me these  
10 pages, which I believe are graphical depictions of the  
11 directory contained in the first floppy disk provided to  
12 us by counsel for the tobacco companies.

13 A Okay.

14 Q Do you have reason to believe that's not what  
15 this is?

16 A Oh, I haven't looked at it completely, but it  
17 appears to have the directory structure that I'd expect,  
18 beginning with tab 65 and ending with tab 73, as I  
19 suggested to you a moment ago.

20 Q All right. There was also a readme file that  
21 was sent along --

22 A Yes.

23 Q -- with this data.

24 A I'm not sure what that says, I'd have to open

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1 it.

2 Q Well, if you look at the third page of Exhibit  
3 11, that's a printout of the readme file.

4 A Okay, just a moment. I'll read it.

5 Okay, I've read that.

6 Q I'm sorry, did you say you've read it over?

7 A Yes.

8 Q Do you know what that readme file is or what it  
9 relates to?

10 A Sure. It's trying to help you with the  
11 structure of the materials.

12 Q And does it refer to a conversion of data by  
13 you or by your office; is that what it's referring to?

14 A Format conversion, not a change of the data.

15 Q Sure. You took the data as you received it,  
16 and then reformatted it in some form that you could use?

17 A Well, I could use it in a lot of forms, but the  
18 form that we've used it in -- this particular tab, we  
19 used this utility called DBMS copy, which is the  
20 conventional thing to do, so that it would be acceptable  
21 input to a -- let's see, I guess this is a SAS format  
22 that we've got here. I'd have to look at it more  
23 closely.

24 Q Can you turn to the page that appears to refer

1 to the contents of the folder entitled "tab65."

2 A Which -- can you give me a number of page?

3 First page?

4 Q The fifth page. Five. If you look in the  
5 upper left-hand corner, it should say "tab65."

6 A No, I don't get that. Okay, I got it now. Go  
7 ahead.

8 Q Can you tell me what's contained in the folder  
9 that's entitled "tab65"?

10 A Well, there's some files there, some of them  
11 are program files such as the second one,  
12 ngr3s\_commit.do. That's an executable file. And  
13 basically these -- I'm not going to go through all of  
14 them, we'll drive the court reporter nuts here, but  
15 these basically are files that I've gotten printed out  
16 and have here in the tabs, in the paper version that  
17 I've brought here, so if I turn to tab 65, in my  
18 materials in Exhibit 5, I have the printed-out version,  
19 and the first thing I see here is ngr3s\_commit.log.  
20 That's an execution version of the program that we --  
21 that I mentioned just a moment ago.

22 Q What do the files in tab 65 relate to?

23 A The -- just a moment, I'll look here. This

24 "ngr" nomenclature is a Dr. Harris nomenclature, so you

1 probably recognize that if you have been involved in  
2 that end of things here. And so what I've done here --  
3 it probably would be helpful to find the section of my  
4 report that's referring to this. Why don't I just do  
5 that. Just a second.

6 Yes, the last sentence of the first paragraph  
7 of Section II where I end that sentence with a footnote  
8 14 --

9 Q Yes.

10 A -- that footnote would direct you to this  
11 material, and when you come here, you'll find that this  
12 is where I found Dr. Harris's model. This particular  
13 thing, called a Cox proportional hazards model, C-o-x,  
14 when applied to the data from the COMMIT study, finds  
15 only a statistically insignificant quit rate of 1.04.

16 Q All right. And the program that you ran, and  
17 to reach that conclusion is contained behind tab 65 in  
18 binder -- Exhibit No. 5?

19 A Let me look and see if I printed it. Yes, the  
20 program file is there too, and it's also on your  
21 computer materials in Exhibit --

22 Q Would that be the SAS file?

23 A -- 11.

24 Yes. Let me make sure of that. I may have

1 more than one thing here. Just a second.

2 I think I did not print -- okay, this is a  
3 stata program, a particular kind of language. And the  
4 log file that I had printed here contains both  
5 programming information and output information in the  
6 same file. So I have here both programming and output  
7 information.

8 Q And those are printed out behind tab 65?

9 A Yes.

10 Q Footnote 14 of your report, Dr. Wecker, also  
11 makes reference to computer files in tabs 66 through

12 69 --

13 A Yes.

14 Q do you see that?

15 A Yes.

16 Q Are those calculations that you ran in addition  
17 to the calculations run in tab 65 to try to estimate the  
18 effect of smoking education from the COMMIT data, based  
19 on Dr. Harris's model, if you understood the question?

20 MR. MINTON: Object to the form.

21 THE WITNESS: I'll answer it. They are  
22 additional calculations that I've run, and they relate  
23 to the same topic, and they do make use of Dr. Harris's  
24 computer calculations, but they are a different Harris

1 program than the one we've just been talking about. The  
2 two subjects are very closely connected.

3 The tab 65 shows what I state at the place on  
4 page 4 of my report, that Harris's Cox proportional  
5 hazard model, when applied to the COMMIT data, shows  
6 essentially no differential quit rate. I'm just  
7 paraphrasing here to speed things along.

8 BY MR. FORESTA:

9 Q Okay.

10 A And then the natural companion to that is to  
11 look at the -- at calculations using Harris models in  
12 these other tabs, 66 through 69, to see what they look  
13 like when I change his very large quit rates or quit  
14 rate multipliers into essentially no difference. So  
15 it's all one thing, but it's easy to get them mixed up.  
16 I should tell you that there's -- tab 73 is a summary of  
17 66 through 69; that's probably easier to digest if you  
18 need the -- if you'd like to bear that in mind.

19 Q Okay. Those are two Excel spreadsheets that  
20 you prepared?

21 A Yes, this tab 73 is, and it's an easier-to-view  
22 summary of 66 through 69.

23 Q What about 65, is there some other depiction of  
24 the results from the calculations you ran in tab 65?



1 A Well, the main part is just that single result  
2 at the bottom of the first page. But this program,  
3 which Dr. Harris wrote, continues on and does the same  
4 sort of calculation with some covariates being employed.  
5 That's on page 2. Essentially the same result, so  
6 there's not really a new opinion here.

7 Q I'm sorry, page 2 of your report?

8 A Page 2 of -- the second page of tab 65.

9 Q Okay.

10 A The nqr3 is a fairly long program, doing more  
11 than one thing. So it gets this result I cite on page 4  
12 of my report, and then it doesn't stop. It keeps -- the  
13 program does more than one thing. It does it all over  
14 again with some covariates. And the way I've printed it  
15 out in Exhibit 5, it happens to be the second page, and  
16 I've numbered the pages. So it's tab 65, page 2, where  
17 it does that, and it keeps right on going and slips into  
18 something called a Gompertz, G-o-m-p-e-r-t-z,  
19 calculation.

20 Again, this is not my introduction of this  
21 concept. This was there in the code as I got it from  
22 Dr. Harris, and so I just keep right on -- the program  
23 keeps right on going and it calculates this Gompertz  
24 material that, as far as I know, Dr. Harris is not

1 referring to, but maybe he is, I'm not sure. And then  
2 it prints a picture of -- the picture in the back is the  
3 Gompertz picture, on the fourth page, and then it quits.

4 Q All right. If I understand what you're saying,  
5 Dr. Wecker, tabs 66 through 72 are simply application of  
6 the COMMIT data to other Harris models that he ran --

7 A I'd say --

8 Q -- is that --

9 A I'd say application of the finding from the  
10 study of the COMMIT data -- well, the finding of the  
11 COMMIT study, or my particular calculation in tab 65.  
12 Then I do the next logical step, which is to apply that  
13 finding to the port -- the programs that Dr. Harris uses  
14 to do further calculations where those numbers are  
15 inputs.

16 Q All right. We've been going for an hour. If  
17 we go another five minutes, we can take a break, because  
18 I'm going to be changing subjects, but I have a few more  
19 questions on some of the computer --

20 A Sure.

21 Q -- files.

22 A A break is fine, and let's plan for a break at  
23 9 o'clock your time so we can watch the news.

24 Q Okay. It will be short.

1 MR. MINTON: The news?

2 MR. FORESTA: Speech.

3 THE WITNESS: Okay, break. He said break.

4 MR. MINTON: No, he said he wants to keep going  
5 for a couple --

6 BY MR. FORESTA:

7 Q I want to get a few more of the computer files  
8 identified, Dr. Wecker, and then take a break.

9 A Sorry; I misunderstood.

10 Q Unless you want to take a break now.

11 A No, please continue.

12 MR. FORESTA: Michael Chang, if you could take  
13 the two-page document that has an Excel spreadsheet  
14 title on the bottom left-hand corner that says  
15 "Disclosed Spread Sheet."

16 (Deposition Exhibit 12 was marked for  
17 identification by the court reporter.)

18 BY MR. FORESTA:

19 Q What exhibit is that?

20 A 12.

21 Q All right. You recognize this document --

22 A Yes.

23 Q -- Dr. Wecker?

24 A Yes, I do.

1 Q Can you tell us what it is, please.

2 A Okay, just a moment. The first two columns --  
3 and when I say that, I mean from both pages, it's all  
4 one thing, the two columns from both page 1 and page 2  
5 of Exhibit 12 -- constitute a replication of the results  
6 in Table 2 of Exhibit 3.

7 Q Exhibit 3 is the 1995 study?

8 A '97.

9 Q All right. So this is a replication of the  
10 results from Table 2 from the '97 study; correct?

11 A Yes.

12 Q That's just the first two columns. What's the  
13 third column of this Exhibit 12 represent?

14 A That's the same thing, but I've also added  
15 another variable, which is the occupation variable, blue  
16 collar, professional and so on. And you see that at the  
17 bottom of the second page.

18 Q All of the other data for the remaining  
19 categories is the same in columns 2 and 3; is that  
20 correct?

21 MR. MINTON: Object to the form.

22 MR. BURTON: Object to the form.

23 THE WITNESS: The input data is. This is a  
24 printout of output.

1 MR. FORESTA: All right. Michael Chang, let's  
2 take the next document. This is the 10- or 12-page  
3 document that has a title on the top "InterventionCity  
4 Crossed with Time Crossed with State."

5 (Deposition Exhibit 13 was marked for  
6 identification by the court reporter.)

7 BY MR. FORESTA:

8 Q You have a copy of that, Dr. Wecker?

9 A Yes.

10 Q Can you identify it for the record, please.

11 A Well, it's one of my computer programs. Can  
12 you tell me what tab you got it out of?

13 Q I might be able to do that. 71.

14 A Okay, just a moment.

15 Q If you refer back to Exhibit 11, there's a  
16 printout, the directory for tab 71, that may help you  
17 identify this.

18 A Okay, just a moment. Okay. I've figured out  
19 what this one is.

20 Q Can you identify it, please.

21 A Okay. It's a printout of a computer program --  
22 well, it's the executed result of the computer program  
23 that has the long name "logisticRegression," all one  
24 word. It's a SAS program. This is the output file.

1 Q And what was your purpose in running this  
2 calculation?

3 A Here I was looking at the issue of the  
4 statistical significance of the intervention effect in  
5 the COMMIT study, taking into account some additional  
6 information that is not taken into account in the 1995  
7 article, which is Exhibit 2.

8 Q What additional information is that?

9 A The additional information is the quit rate of  
10 the different-studied cities prior to the intervention.  
11 Prior to the intervention program.

12 Q Okay.

13 Michael Chang, can you take the next document,  
14 should be a two-page document, have that marked Exhibit  
15 14, please.

16 (Deposition Exhibit 14 was marked for  
17 identification by the court reporter.)

18 BY MR. FORESTA:

19 Q Dr. Wecker, I will represent to you that this  
20 is another file that we printed out from a folder  
21 entitled "tab71."

22 A Okay, let me look for it. Just a moment.

23 Okay. I have got this one figured out.

24 Q Can you identify it for the record, please.

1           A    Okay. This is just a fragment here, but it's  
2           producing quit rates, at the bottom portion of the first  
3           page and continuing on to the second page, that are  
4           the -- part of the input that goes into Exhibit 13, to  
5           the program that creates Exhibit 13.

6           Q    All right.

7           A    It's the quit rates.

8           Q    This document precedes Exhibit 13 in its  
9           creation, correct?

10          A    Right. You need -- Exhibit 13 needs this as  
11          part of its input.

12          Q    And what's the source of the information  
13          contained in Exhibit 14?

14          A    The COMMIT CDs.

15          MR. FORESTA: All right. Michael, can you take  
16          the document that has the title on the top "Harris  
17          Report 7 Replication," have the court reporter mark that  
18          as Exhibit 15, please.

19                   (Deposition Exhibit 15 was marked for  
20                   identification by the court reporter.)

21          BY MR. FORESTA:

22                Q    Dr. Wecker, I apologize for skipping around,  
23                but before we get to Exhibit 15, if you could go back to  
24                Exhibit 11, which is the graphical display of the file

1 directory, and turn to the page with the title "tab72."

2 A Okay.

3 Q Can you identify what the files are that are  
4 contained in the folder entitled "tab72"?

5 A Okay. Just a minute.

6 Q What I'd like you to do is explain what those  
7 files represent rather than whisper us what each of them  
8 is.

9 A Okay. The -- let me go after the easy ones  
10 first here. The second one, diff18.lst, that is an  
11 output from the next file, dot SAS, so we've got two of  
12 them, and the gist of this one is that it's replicating  
13 the result of the 1995 article where that article -- I  
14 think it's Exhibit 2, gets 1.8 percent difference.

15 Q Okay. That's with no new information, no new  
16 data, Dr. Wecker?

17 A Right, it's just a replication.

18 Q Okay. What about the next two files, what do  
19 they relate to?

20 A Okay, it will just take me a second. Okay,  
21 this is a calculation that is almost identical to the  
22 replication but it has one difference, and that is, I --  
23 when it comes to the quit rates for each of these city  
24 pairs, I'm subtracting the quit rates -- that



1 differential that existed prior to the intervention, and  
2 then the rest is the same calculation.

3 Q I'm sorry, when you say the same as the -- "the  
4 rest is the same calculation," what are you talking  
5 about?

6 A We just talked about the diff18 calculation,  
7 which is a replication. Think of it as the calculation  
8 that gets 1.8 percent --

9 Q All right.

10 A -- the number that figures prominently in the  
11 '95 article. And first I simply replicated it to make  
12 sure I understood it and knew how it was calculated.  
13 And then with this program I'm telling you about now, I  
14 make a slight change. The slight change is to  
15 incorporate the prior quit rates, quit rates prior to  
16 the beginning of the intervention.

17 Q Okay. And that new calculation is reflected in  
18 the files diff18\_88?

19 A Yes.

20 Q Okay. What about the paired files with the  
21 title "diff18\_maBC"? Capital B, capital C.

22 A Okay, just a second. Okay, that is a  
23 calculation that's like the first one we discussed, the  
24 replication, but with one change. And that is, it's

1 restricted to blue-collar male people only.

2 Q Okay.

3 A Should I do -- should I do the last one?

4 Q Yes, please. I could guess.

5 A Yeah, that's -- okay, next question. That's an  
6 easy one.

7 Q Right. Let's move on to Exhibit 15, which  
8 we've already marked.

9 A Okay. All right.

10 Q Can you identify that for the record, please.

11 A Yes, I recognize it as a format from a  
12 Dr. Harris program, and if you were to look at -- I'm  
13 doing this from memory, so maybe I'll get a page wrong,  
14 but I think his, what I call report 7, it's the letter  
15 that comes after report 6 --

16 Q Okay.

17 A -- on the second page, you'd see a  
18 correspondence in the top portion of that page, if I'm  
19 remembering correctly, but if you give me a minute, I'll  
20 try to find it in my materials here. I think it's in  
21 tab 73.

22 Okay. It's -- so it's just running Harris's  
23 programs and replicating, without changing anything, his  
24 programs that get this item, and if I had his report 7

1 here, I'd double-check, but I believe if I pick it up,  
2 you'd find the same numbers in both places. I'm doing  
3 this because I'm about to make changes to this. It's a  
4 starting point.

5 Q You're about to make changes to what?

6 A Well, in the flow of the documents here that  
7 I'm -- that you're asking about, and I'm trying to  
8 explain, this is a starting point for some variations on  
9 this initial calculation, and --

10 Q I see.

11 A -- the whole point of it is, I didn't want you  
12 to search for a deep point here, it's just a starting  
13 point, and the deeper point is the variations that  
14 follow.

15 Q I thought you were about to change your  
16 opinions, Dr. Wecker.

17 A No, no chance.

18 MR. FORESTA: Michael Chang, I think the last  
19 document in the pile that you have may be a copy of a  
20 letter from Dr. Harris to Laurie Dix, dated September  
21 27, 2000. You see that somewhere?

22 MR. CHANG: Yeah. You're talking about to  
23 Laurie Dix?

24 MR. FORESTA: Yes. Can you hand that to the

1 court reporter and have her mark that as the next  
2 exhibit, please.

3 MR. CHANG: Sure.

4 (Deposition Exhibit 16 was marked for  
5 identification by the court reporter.)

6 THE VIDEOGRAPHER: Excuse me, this is the  
7 videographer. In about five minutes, we'll have to  
8 break to change the tapes.

9 MR. FORESTA: All right, I only have five  
10 minutes of questioning left on this topic, and then  
11 we'll take a break.

12 Q We're going to put this aside for a second,  
13 Dr. Wecker, just because at the break I need to check  
14 something out about the document, so if you wouldn't  
15 mind just handing that back to Michael, we'll pick this  
16 up again, but I only wanted to mark it so that you would  
17 be able to say this is what I referred to as Harris  
18 report 7. But putting it aside for the time being, the  
19 handwriting that appears on page 2 of the letter, is  
20 this what you are referring to as Harris ??

21 A Well, I think it is, but I don't have my  
22 materials from earlier deposition here. It certainly  
23 has the right appearance.

24 Q Okay. Why don't you give that back to Michael,

1 and we'll pick up with this document again, if we need  
2 to, later on this evening.

3 A Well, I'll give it to the court reporter,  
4 because now that it's marked, it seems like the right  
5 thing to do.

6 Q Thank you, sir.

7 All right, getting back to Exhibit 15, am I  
8 correct, sir, that the first two pages are -- well, why  
9 don't I ask you: What do the first two pages represent?

10 A The first page was the replication. It says  
11 "Replication" at the top of -- now maybe I can check the  
12 numbers. Just a moment. Right, these numbers on the  
13 first page of Exhibit 15 are the same as the top two  
14 panels from the second page of Exhibit 16.

15 Q Okay.

16 A And then you asked what's the next page?

17 Q Yes.

18 A That's a continued replication of the remainder  
19 of the tables in Exhibit 16.

20 MR. FORESTA: All right. Why don't we take a  
21 break at this point. We'll pick up in ten minutes.

22 THE WITNESS: Okay.

23 MR. MINTON: All right.

24 THE VIDEOGRAPHER: Thank you. The time is

1 4:08. We're going off the videotaped record.

2 (Recess.)

3 THE VIDEOGRAPHER: This marks the beginning of  
4 Videotape No. 2 in the deposition of William Wecker.

5 The time is 4:34. We are back on the videotaped record.

6 BY MR. FORESTA:

7 Q All right, Dr. Wecker, we're back on. When we  
8 took our break, we were discussing Exhibit 15. And I  
9 believe you had described for the record, or identified  
10 for the record what the first two pages consist of; is  
11 that correct?

12 A Yes.

13 Q Would you turn to the third page, please, and  
14 explain for the record what that Excel chart represents.

15 MR. MINTON: Can you still hear us, Mike?

16 Hello.

17 MR. FORESTA: Yeah, it's Steve, and we can hear  
18 you. Can you hear us?

19 MR. MINTON: Yeah, the picture's just changed  
20 weirdly here.

21 THE WITNESS: I'm pausing here to figure this  
22 one out. Just a moment. It looks to me like you've  
23 just printed page 1 over again.

24 BY MR. FORESTA:

1 Q On page 1 of Exhibit 15, the heading says  
2 "Harris Report 7 Replication"; correct?

3 A Yes.

4 Q And on page 3 of my version of Exhibit 15, the  
5 heading says "Harris Report 7 Replication with R2  
6 changed 3.0 to 1.0."

7 A Well, but not on my version.

8 Q Okay. Do you have a page following that that  
9 says "Harris Report 7 Replication with R2 changed 3.0 to  
10 1.0"?

11 A Yes, I do, a couple of pages later.

12 Q Okay. Can you tell me what that page is?

13 A Okay.

14 Q Or what that chart represents, rather. I'm  
15 sorry.

16 A Just a moment. That's the same computation  
17 that is shown on page 1, and in this exhibit, again on  
18 page 3, except there's -- one of the parameters of the  
19 calculation that goes by the name of R2, in the page 1  
20 calculation it has a value of 3 and in the page -- this  
21 is the page -- the fifth page here, it has been changed  
22 by me to 1.

23 Q And what is the R2 parameter?

24 A You mean what does it mean or what does --

1 Q Yes. What does it mean?

2 A It refers to a quit rate multiplier in the  
3 context of a Harris calculation for the 1963 to 2000  
4 period.

5 Q So what you've done on this chart is you've  
6 changed the quit rate multiplier from 3 to 1 and you  
7 calculated the results and depicted them here on this  
8 chart?

9 A That's right.

10 Q Hopefully, the next page will have the heading  
11 "Harris Report 7 Replication with R2 changed 3 to 1.0  
12 and r2 changed 0.7 to 1.0."

13 A Yes.

14 Q Is that what you see?

15 A That's what I see.

16 Q All right. Can you please explain for the  
17 record what this Excel spreadsheet chart represents?

18 A This makes the one additional change, as  
19 indicated in the title, that the Harris initiation rate  
20 multiplier, which he has set in the '63 to 2000 period  
21 equal to .7, I'm setting it equal to 1.

22 Q These are not calculations that you ran for the  
23 first time in the preparation of this report, are they?

24 MR. UGARTE: Objection.



1 THE WITNESS: Well, I've run calculations that  
2 are similar to this, but I believe these -- this may be  
3 the only -- I'd have to go look at my earlier  
4 deposition. Whatever I ran before is in my work papers  
5 from my other depositions, and I've done something  
6 similar to this, but I don't believe quite exactly the  
7 same thing.

8 BY MR. FORESTA:

9 Q Okay. So is it true, Dr. Wecker, that prior to  
10 your preparation of this supplemental report, you had  
11 not run a calculation of the Harris model with the quit  
12 rate multiplier set at 1?

13 MR. UGARTE: Objection.

14 THE WITNESS: Well, there's two quit rate  
15 multipliers, and so I'll start with that. Second, I  
16 would just have to get the materials I do not have with  
17 me, but you have them, and I have them back at my  
18 office, to look through the several volumes of computer  
19 work that I've done previously, and given to you, to see  
20 exactly what runs I had done previously. I just don't  
21 remember that well enough to tell you.

22 BY MR. FORESTA:

23 Q What is the basis for running the Harris model  
24 as it's depicted in the third page -- the fifth page of

1 this Exhibit 15 with a multiplier of 1 as opposed to 3?

2 A Well, that idea is the one we were discussing  
3 before the break, where I have taken the COMMIT data,  
4 and using that data, and a Harris program, I have found  
5 quit rates -- quit rate multipliers of essentially 1.  
6 So now I'm going to the next obvious step which is  
7 following the Harris calculation method and using that  
8 as input to his successor program.

9 Q So you -- so I understand it, you took the  
10 COMMIT data and you calculated a quit rate multiplier of  
11 1; is that correct?

12 A Essentially 1. It's 1 with some decimal points  
13 and it's not significant, so essentially 1.

14 Q And the calculations that led to your arriving  
15 at "this is the quit rate" are set forth in the  
16 materials in your binder, Exhibit No. 5; is that  
17 correct?

18 A Yes, there, and it's also described in my  
19 report in the place that I directed to you -- directed  
20 you to on page 4.

21 Q Well, the only number that I saw on page 4 of  
22 your report is a multiplier of 1.04. That's different  
23 than 1.0; correct?

24 MR. MINTON: Objection. Object to the form.

1 THE WITNESS: It's different, but I'm  
2 describing it as essentially 1. It's not statistically  
3 different from 1, and it is the starting point that  
4 motivates the calculation where I'm using a value of 1  
5 in the Exhibit 15 materials that we were just  
6 discussing.

7 BY MR. FORESTA:

8 Q All right. I just want to make sure that when  
9 you make a reference to a number in your expert report,  
10 the only number that I see is 1.04, and what you're  
11 saying now in the model that you ran as depicted in  
12 Exhibit 15, that is represented as 1.0?

13 MR. UGARTE: Objection. Mischaracterizes the  
14 expert report.

15 MR. MINTON: Also asked and answered.

16 BY MR. FORESTA:

17 Q Just trying to clarify the record, make sure I  
18 understand.

19 A The motivation for the Exhibit 15 materials in  
20 part, since the opinion that I arrive at of not finding  
21 any noticeable effect from information I had before I  
22 started the COMMIT data. But the new thing here in this  
23 new report is that I studied the COMMIT data, and the  
24 COMMIT data leads me to a number that is essentially a

1 quit rate multiplier of 1. I print it here as 1.04, and  
2 I describe it as a statistically insignificant quit  
3 rate, meaning not differing statistically from a value  
4 of 1. Bearing that in mind, I said, "Well, now let's  
5 see what the rest of the Harris programs do when you use  
6 a value of 1 instead of a value of 3," as he has used.

7 Q All right. And that's depicted in the fifth  
8 page of your Exhibit 15 as you've already testified.  
9 And the next page again uses the 1.0 quit rate  
10 multiplier, and then changes the initiation rate; is that  
11 correct, from .7 to 1?

12 A Right.

13 Q What is the basis for making that change,  
14 Dr. Wecker?

15 A Well, you can -- I could refer to the COMMIT  
16 study where they find no noticeable effect on  
17 prevalence, but I think more fairly, it's that plus the  
18 cumulative understanding that I've arrived at from all  
19 of the study I've done in this case, and which has been  
20 the subject of your questions in at least two other  
21 depositions.

22 Q The COMMIT study did not analyze initiation  
23 rates, did it?

24 A It does mention prevalence. I'd have to study

1 for a bit to find the spot. So if it finds no effect on  
2 quitting and no effect on prevalence, that's -- suggests  
3 to me that there's no effect of any kind.

4 Q My question is: Did the COMMIT study analyze  
5 initiation rates?

6 A Well, I gave you a good answer to that.

7 MR. MINTON: Object to the form.

8 BY MR. FORESTA:

9 Q And I'll ask the question again, because you  
10 said it mentions prevalence rates. And I just want a  
11 yes-or-no answer.

12 Does the COMMIT study analyze initiation rates?

13 MR. MINTON: Object to the form. He doesn't  
14 have to answer yes or no.

15 THE WITNESS: I --

16 BY MR. FORESTA:

17 Q Can you answer yes or no?

18 A I don't think a meaningful answer could be a  
19 one-word answer here. I would have to review the  
20 voluminous materials to see if they ever get around to  
21 mentioning initiation rates, at least I don't recall it  
22 right now, but they may well have. I do recall that  
23 they mentioned that they saw no effect on either  
24 prevalence or quitting, at least no large effect.

1 And --

2 Q How many people were included in the COMMIT  
3 study at its outset?

4 A Oh, well, it depends on what you mean by the  
5 "outset." The rostering phase or the -- the beginning  
6 had a fairly complicated start. There were long lists  
7 of houses -- or households, and then a smaller list of  
8 some 35,000 folks, and it kept whittling down from there  
9 depending on what they were doing.

10 Q Have you ever seen the figure 20,347 people as  
11 a number of people included in the COMMIT survey?

12 MR. MINTON: Object to the form.

13 THE WITNESS: 20,347? Just a moment.

14 MR. MINTON: Do you want to say whether or not  
15 you're talking about baseline, evaluation, endpoint,  
16 what you mean by the term "survey"?

17 MR. FORESTA: I think I said in the COMMIT  
18 study.

19 MR. MINTON: Well --

20 THE WITNESS: I know where that number comes  
21 from, yes. I've just added two numbers. That's the  
22 number that they intended to follow up. It's the number  
23 that if you had had all responding people in 1993, you  
24 would see 20,347 males and females.

1 BY MR. FORESTA:

2 Q And that's the number of people that the  
3 investigators of the COMMIT study intended to follow;  
4 correct?

5 MR. BURTON: Object to the form.

6 THE WITNESS: That's my understanding of what  
7 they were doing, yes.

8 BY MR. FORESTA:

9 Q How many of those people were smokers?

10 A All of them.

11 Q None of those people would have started smoking  
12 during the onset of the -- or during the time period of  
13 the COMMIT study; correct?

14 MR. MINTON: Object to the form --

15 MR. UGARTE: Objection.

16 MR. MINTON: -- of the question.

17 THE WITNESS: That depends on where you start  
18 the time period. But I take it that by the time they  
19 get to this four-year follow-up phase, they were current  
20 smokers as of that time.

21 BY MR. FORESTA:

22 Q Do you think that some of the 20,347 that the  
23 investigators intended to follow were not smoking at the  
24 outset of the COMMIT study?

1 MR. UGARTE: Objection. Calls for speculation.

2 THE WITNESS: I didn't think so.

3 BY MR. FORESTA:

4 Q Can you turn to the next page of Exhibit 15,  
5 please.

6 A Just a moment. Okay.

7 Q Does your version have at the top of the page  
8 "Harris Report 7 Replication with R2 changed to" --  
9 "changed 3 to 1.0 and r2 changed 0.7 to 1.0 and R1  
10 changed 1.5 to 1.0"?

11 A Yes, it does.

12 Q Can you tell us what the -- what this page  
13 represents?

14 A Yes, it's the same as the previous page with  
15 the one additional change, that the quit rate in the  
16 earlier period, 1954 to '62, I think, has been changed  
17 from the Harris multiplier of 1.5 to a value of 1.

18 Q And what was your basis for changing the  
19 earlier quit rate from 1.5 to 1?

20 A Importantly, and in part, the finding from  
21 the -- my study of the COMMIT data that there was no  
22 effect of the intervention, and, additionally and  
23 cumulatively, my findings of -- that have been the  
24 subject of your two other depositions where we've talked



1 about the lack of effect of information such as  
2 Sellikoff (phonetic) messages.

3 Q The next page on Exhibit 15 appears to be the  
4 same -- to have the same title as the previous page  
5 except the last line now says "and r1 changed 0.9 to  
6 1.0." Do you see that page, Dr. Wecker?

7 A Yes, I do.

8 Q Can you tell us what this chart represents?

9 A It's the same as the previous page except for  
10 the one change where the '54 to 1962 time period  
11 initiation rate multiplier has been set to 1.

12 Q What was your basis for changing the initiation  
13 rate from .9 to 1?

14 A Importantly, the COMMIT study results, but  
15 cumulatively and also all the indications that I've  
16 gotten of the lack of effect of these kinds of  
17 informational programs that we've discussed. I guess  
18 you weren't there, but in other depositions in this case  
19 that were taken by some of your colleagues.

20 Q And tell me how the COMMIT data influenced or  
21 affected your opinion that led you to change the  
22 initiation rate for the earlier period of time from .9  
23 to 1.0.

24 A That would be the same answer I gave before.

1 The indication is of no -- no effect from these programs  
2 either in terms of quitting or prevalence which implies  
3 initiation.

4 Q How many nonsmokers were the subject of a  
5 COMMIT intervention?

6 A Well, there were --

7 MR. MINTON: Object to the form.

8 THE WITNESS: I don't have a number, but there  
9 would be a lot of residents in the intervention cities  
10 who were nonsmokers.

11 BY MR. FORESTA:

12 Q And it's your testimony that they were targets  
13 of the COMMIT intervention?

14 A They were -- they would be recipients of that  
15 information.

16 Q And how many of those people were studied by  
17 the investigators of the COMMIT study?

18 MR. UGARTE: Objection. Vague and ambiguous.

19 THE WITNESS: Well, I don't have a ready answer  
20 for that. I'd have to find, and I don't believe I have  
21 here, more voluminous materials. If maybe -- you want  
22 me to take the time, I can look through what little I  
23 have here, which is Exhibit 2 and 3, and look for  
24 references to -- for example, prevalence.

1 BY MR. FORESTA:

2 Q Well, we're going to turn to Exhibit 2 and 3 in  
3 a few minutes anyway, so --

4 A Okay.

5 Q -- we'll deal with that topic, then.

6 A Great.

7 Q I just want to get one more computer printout  
8 out of the way so we can move on to another topic.

9 Michael, can you take the one-page document out  
10 there that has a series of boxes, have that marked as  
11 Exhibit 16, please.

12 THE REPORTER: I think we should be at 17.

13 MR. FORESTA: I'm sorry, 17.

14 (Deposition Exhibit 17 was marked for  
15 identification by the court reporter.)

16 BY MR. FORESTA:

17 Q Do you have that, Dr. Wecker?

18 A Yes, I do.

19 Q And do you recognize it?

20 A I do, yes.

21 Q Can you just state for the record what this one  
22 page reflects?

23 A This is all related to the materials we've been  
24 looking at with the various changes setting certain

1 Harris inputs equal to 1. The first thing I notice  
2 here, if you permit, is that I inadvertently left off  
3 the fourth row of the first table. And if it's okay  
4 with you, I could just write those numbers in on the  
5 exhibit. If you don't want me to do that, that's fine.

6 Q I don't have a problem.

7 A Okay.

8 Q You can write it down.

9 A I'll just write them out.

10 Q Can you just state for the record what the  
11 numbers are so I can mark it on my version.

12 A Okay. 0.1046; 0.0990; 0.0904; 1.000.

13 Q Can you tell me what the first series of four  
14 boxes represents?

15 A The first panel is, as it says, just a  
16 replication on -- of the second and third page of the  
17 Harris report 7. This is an intermediate calculation in  
18 that chain of arithmetic. I think there is a spot where  
19 you can see a display something like this in Harris  
20 report 6, but I don't have that with me. But anyway,  
21 when you do the calculation in report 7, you have to do  
22 this step in order to get to the answers in Exhibit 15.

23 Then, if I can just continue, the other ones  
24 are easy, because we've been through this.

1 Q Right.

2 A R2 set equal to 1 and so on. It's cryptic, but  
3 you should have the idea by now.

4 Q Again, this is a situation where Exhibit 17 is  
5 generating intermediate information that is then plugged  
6 into the charts of Exhibit 15?

7 A Right. It's really one -- you're exactly  
8 correct. You do the -- you do 17 as part of coming up  
9 with 15, but it's really 15 that is, you might say, the  
10 bottom line of the calculation or the  
11 more-easy-to-interpret part of the calculation.

12 Q All right. Let's go to Exhibit 2, which is the  
13 1995 study.

14 A Okay, I got it.

15 Q And if you could look through that now and show  
16 me where there is evidence or where there is any mention  
17 here on the effect of a COMMIT intervention on smoking  
18 initiation rates.

19 A Okay. This is -- this will take a few minutes.  
20 I'm going to read it. It's a ten-page document. I'll  
21 get started.

22 Q Thank you.

23 A Just to give you a chance to stop this process,  
24 I'm partway through the second page, but I've already

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1 found two places that I could call your attention to.

2 Q Okay.

3 A And I'd be glad to continue this, but I want to  
4 give you a chance to tell me to stop, if you don't think  
5 I'm going fast enough. What's your pleasure?

6 Q Can you tell me the first two that you've  
7 found?

8 A Okay. On the first page, in the middle, I read  
9 the section that says that a "communitywide strategy  
10 would make it difficult for residents to avoid exposures  
11 to the messages about the importance of nonsmoking," and  
12 then it continues, "and would alert smokers to . . .  
13 opportunities for cessation." I take that as --  
14 consistent with the point that I made earlier. Would  
15 you like the second one?

16 Q Now I'd like you to answer this question first.  
17 Does that passage that you just read show that the  
18 COMMIT study investigators were investigating the effect  
19 of a COMMIT intervention on initiation rates?

20 A Not by itself. It shows that they were -- they  
21 were recognizing that the interventions would be  
22 interventions for the entire population of residents  
23 including the smokers and nonsmokers. I think that --  
24 it doesn't seem like much of a stretch to see how that

1 would affect initiation as well as quitting.

2 Q Okay. Let me ask a different question, then,  
3 to try and narrow your review of the document. Can you  
4 point to me, somewhere in this 1995 report, the results  
5 that show what effect the COMMIT intervention had on  
6 initiation rates?

7 A I haven't gotten that far. I've gotten partway  
8 through the second page, and I might helpfully tell you  
9 what I find there because it seems to point to a  
10 document of the kind you're inquiring about.

11 Q Okay.

12 A In the first column on the second page, which  
13 is page number 184 --

14 Q Yes.

15 A -- about the middle there, it says  
16 "Cross-sectional changes in prevalence were measured as  
17 another test of the intervention and are reported  
18 separately," and it gives a footnote 11 to study in  
19 which they talk about changes in prevalence.

20 Q Okay. Footnote 11 makes reference to an  
21 article entitled "COMMIT Research Group Community  
22 Intervention Trial for Smoking Cessation," in  
23 parentheses "(COMMIT): Roman II. Changes in Adult  
24 Cigarette Smoking Prevalence." Do you see that?

1 A I do.

2 Q Did I read that correct?

3 A I wasn't following you. Sorry. I didn't

4 proofread it for you, but --

5 Q That's all right. If you just take a look,  
6 though, at footnote 11 and the article that's referenced  
7 there, I want to ask you: Is that an article that you  
8 have referenced as material that you considered in  
9 formulating the opinions that are set forth in your  
10 Exhibit 1?

11 A No, it's an article that's included and  
12 mentioned in an article that I cited.

13 Q Did you consider the article in formulating the  
14 opinions set forth in Exhibit 1?

15 A I did not specifically consider that article,  
16 but I did consider the point that is --

17 Q So when you -- I'm sorry.

18 A Go ahead.

19 Q Can you finish your answer. I didn't mean to  
20 cut you off.

21 A That's okay, go ahead. Go ahead.

22 MR. FORESTA: Can you -- Court Reporter, can  
23 you please read back the last response. I lost it on  
24 this end.

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Evidence



1 (Record read.)

2 BY MR. FORESTA:

3 Q The point is what, Dr. Wecker?

4 A The point is that the COMMIT intervention was  
5 an intervention that would have exposed residents,  
6 whether they are smokers or not, to messages about the  
7 importance of nonsmoking. And I'm quoting from the  
8 Exhibit 2 article. That's not --

9 Q And you --

10 A Let me just finish. That's not a quitting  
11 story, that's an all residents, importance of nonsmoking  
12 statement. Go ahead.

13 Q You came up with a specific number in your  
14 calculations for a change in smoking initiation rates;  
15 isn't that correct?

16 A In the calculation that is in Exhibit 15, if  
17 that's what you mean, yes.

18 Q That's what I mean, yes. And in arriving at  
19 that number, you said you relied upon the COMMIT  
20 study --

21 A In part, yes.

22 Q -- correct?

23 A In part.

24 Q In part. In part. And I want to know what

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1 part of the 1995 study, besides this reference to  
2 another article, supports the change that you made in  
3 the initiation rates for smoking --

4 MR. MINTON: Object to the --

5 BY MR. FORESTA:

6 Q -- as part of the calculations set forth in  
7 Exhibit 15.

8 MR. MINTON: Object to the form of the  
9 question. It assumes that "the COMMIT study" is  
10 entirely embraced in the 1995 article.

11 MR. FORESTA: I'm limiting right now to Exhibit  
12 No. 3, which is the 1995 study. I just want any  
13 reference in there that show quantitatively what the  
14 change in smoking initiation rates were as a result of  
15 COMMIT interventions.

16 MR. MINTON: That's a different question.

17 BY MR. FORESTA:

18 Q Can you answer that question, Dr. Wecker?

19 A Well, I've -- I went forward trying to answer  
20 your question that was like that, and I got these two  
21 points to tell you about as I made it onto the beginning  
22 of page 2. And if you want me to, I'll continue from  
23 there and see what other points I might find. But I  
24 just don't have a photographic recall of these things,

1 and your question really requires me to go through the  
2 document to find them.

3 Q What I would like you to do, Dr. Wecker, is go  
4 through the report, and point out to me any section of  
5 this 1995 study that quantifies the effect of a COMMIT  
6 intervention on smoking initiation.

7 A Okay. You've got one -- you've got one  
8 point -- the two points I've made are certainly relevant  
9 to that, and I would take -- and I will continue from  
10 there and see what else I can find.

11 Q Is it your testimony that those first two  
12 points represent a quantification of the effect of  
13 COMMIT interventions on smoking initiation?

14 A No, I don't think they quantify, but I  
15 mentioned those points in answer to your question that  
16 was earlier. And your earlier question didn't say  
17 quantify, so --

18 Q Now I'm asking a different question.

19 A So I'm going to proceed, if you want me to, and  
20 I'll pick up on page 184, and I'll see what else I can  
21 find.

22 MR. MINTON: And again, I object to the  
23 characterization of that being "the" COMMIT study,  
24 because he's referenced at least two other COMMIT

1 studies or write-ups of COMMIT data that he has  
2 discussed.

3 BY MR. FORESTA:

4 Q You would agree with me, Dr. Wecker, that the  
5 first two references in the 1995 study that you pointed  
6 out do not quantify the effect of COMMIT interventions  
7 on smoking initiation; correct?

8 A I think that's correct, although the second  
9 reference is of a special kind in that it's pointing to  
10 an entire report.

11 Q A report that you did not consider in preparing  
12 this -- your supplemental report; correct?

13 MR. UGARTE: Objection.

14 THE WITNESS: That's correct, I did not. I'm  
15 waiting for your question.

16 BY MR. FORESTA:

17 Q Oh, I'm sorry. My question is: Can you point  
18 out to me anything in the 1995 study which has been  
19 marked as Exhibit 2 that quantifies the effect of COMMIT  
20 interventions on smoking initiation rates?

21 MR. UGARTE: For the record, you're referring  
22 to the text of the study as opposed to the underlying  
23 data that consists of COMMIT data that supported the  
24 study?

1 MR. FORESTA: Show me anything here.

2 MR. UGARTE: Again, you're talking about the  
3 text of the article; correct?

4 MR. FORESTA: If he knows that there --

5 Q Dr. Wecker, I'll address this to you rather  
6 than Mr. Ugarte. If you know of any reference in a  
7 footnote that quantifies the effect of a COMMIT  
8 intervention on smoking initiation, please let me know  
9 that.

10 A Okay, I'm going to take some time here, because  
11 quite a few pages, and when you don't hear me talking,  
12 it's because I'm reading.

13 Okay. I'm finished.

14 Q All right, did you find anything?

15 A No, I don't find anything further in this  
16 particular article that would be responsive to that --  
17 to your question.

18 Q Dr. Wecker, is prevalence the same thing as  
19 initiation?

20 A No.

21 Q What is prevalence?

22 A It's a proportion of -- in this context, it's  
23 the proportion of a population who are smokers.

24 Q And what is initiation?

1 A It's an event of changing from status of  
2 nonsmoker to smoker.

3 Q Can you take a look at Exhibit 3, which is the  
4 1997 article entitled "Predictors of Smoking Cessation  
5 in a Cohort of Adult Smokers Followed for Five Years."

6 A I have it.

7 Q Okay. Is it your opinion, Dr. Wecker, that  
8 there is information or data contained in this report  
9 that supports your belief that the COMMIT interventions  
10 influenced or affected initiation rates?

11 A Okay, I'll have to review this one too, because  
12 I don't have that detail to recall. I'll get started.

13 Q Okay. But just before you do that, you don't  
14 have a recollection one way or the other as to whether  
15 or not this report has information relating to the  
16 effect of COMMIT interventions on initiation rates?

17 A I can't tell you where I have read what I  
18 recalled earlier about the lack of effect on prevalence.  
19 And so it might be in here, it might be in some other  
20 reference, so I'll -- to answer your question, I'll just  
21 have to take the time to look through it.

22 Q But just before you do that, information on the  
23 lack of an effect on prevalence is different than an  
24 effect on initiation rates, isn't it?

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1 A It's not different, if you also understand a  
2 lack of effect on quitting.

3 Q Okay.

4 A Shall I begin?

5 Q So your -- I'm sorry, you finished the answer?

6 A I finished the answer.

7 Q Okay. So your opinion that there is an effect  
8 on initiation rates is a combination of your belief on  
9 the effect of the COMMIT interventions on quitting, plus  
10 information relating to the prevalence of smoking  
11 amongst the COMMIT communities --

12 MR. MINTON: Object --

13 BY MR. FORESTA:

14 Q -- is that a fair characterization?

15 MR. MINTON: Object to the form.

16 THE WITNESS: As far as COMMIT goes, I believe  
17 that's the impression that I took away, but my  
18 recollection is imperfect on exactly what might be  
19 printed here, and so if I -- if you want me to review it  
20 to look for other sentences that might be more on  
21 target, I'd be glad to do it.

22 BY MR. FORESTA:

23 Q Well, I will once again, then, now that I  
24 understand better your approach to this, what I would

1 like to do is ask you more specifically, if you could  
2 review the 1997 study and see if there is anything in  
3 here that quantifies the effect of COMMIT interventions  
4 on initiation rates.

5 A Okay, I'll get started.

6 Q Thank you.

7 A I don't see any quantitative assessment of  
8 initiation in the '97 article.

9 Q Doctor, do you believe that education about  
10 smoking can have an effect on smoking quit rates?

11 A From the evidence that I've seen, it appears  
12 that it does not.

13 Q Under no circumstances, in your opinion, could  
14 a campaign of education on smoking have an impact on  
15 quit rates --

16 MR. MINTON: Object --

17 BY MR. FORESTA:

18 Q -- is that your testimony?

19 MR. MINTON: Object to the form of the  
20 question.

21 THE WITNESS: That's not what I said.

22 BY MR. FORESTA:

23 Q Okay, then I misunderstood your response.

24 In general, do you believe that a campaign of

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1 information on smoking can have an effect on smoking  
2 quit rates?

3 A From the evidence that I've seen, it appears  
4 that it does not.

5 Q And what's the evidence that you've seen on  
6 this subject?

7 A Well, as far as the subject of this deposition,  
8 it's just the COMMIT data. Of course, in my other  
9 depositions, there have been questions on these issues  
10 there as well. But limiting myself to this deposition  
11 issue, it would have to just be the COMMIT data.

12 Q Based on your knowledge of other information,  
13 outside of COMMIT data --

14 MR. UGARTE: Objection. Doctor, I'll instruct  
15 you not to answer. We are here about the COMMIT data.

16 MR. FORESTA: I'm asking his opinions on quit  
17 rates. This is the very subject of his testimony, and  
18 you can't direct him not to answer a question because  
19 he's not your witness.

20 MR. UGARTE: It's outside of the scope.

21 MR. FORESTA: It's not outside of the scope.

22 MR. UGARTE: It's outside of the scope.

23 MR. FORESTA: It's a fundamental aspect --

24 Rich, it's a fundamental aspect of his testimony here.

1 MR. UGARTE: I understand that.

2 MR. FORESTA: If he tells me that under no  
3 circumstances at all could a campaign of information on  
4 smoking ever change quit rates, I'm entitled to know  
5 that, if that's his opinion.

6 MR. UGARTE: He is asked -- you've asked the  
7 question, and he has told you that based on the COMMIT  
8 data that is at issue in this deposition; that's how he  
9 answered the question.

10 BY MR. FORESTA:

11 Q And I'm asking you, Dr. Wecker, outside of the  
12 COMMIT data, are you aware of any studies published in  
13 the medical or scientific literature that show that a  
14 campaign of smoking information or smoking education can  
15 have an effect on quit rates?

16 MR. BURTON: Let's stop here for a minute.  
17 Steve, you've had this man, or someone from the  
18 plaintiffs had this man on examination on this issue for  
19 16 hours in connection with his original report. He was  
20 deposed for 16 hours. We are here in connection with  
21 this report. What I don't want to have happen is  
22 transform this deposition, which is a supplemental  
23 report based on the COMMIT data, into a deposition or a  
24 redeposition about his original report. We're not going

1 to do that.

2 MR. FORESTA: Okay, that's fine. And that's  
3 not my intention. What I want to find --

4 MR. BURTON: That's what you're asking.

5 MR. FORESTA: No, that's not what I'm asking.  
6 What I want to find out now is whether Dr. Wecker has  
7 put blinders on for purposes of this supplemental  
8 report.

9 MR. BURTON: He already told you he didn't.

10 MR. UGARTE: And you have asked and answered  
11 that question in prior testimony. It's on the record.

12 BY MR. FORESTA:

13 Q No. I'm asking you, Dr. Wecker, right now, are  
14 you aware of any literature, any articles in the  
15 scientific or medical literature, that show that  
16 education on smoking has an effect on quit rates; are  
17 you aware of that?

18 MR. UGARTE: Objection. Dr. Wecker, I'll  
19 instruct you not to answer that question. We are here  
20 to talk about the COMMIT data as referenced in this  
21 report.

22 MR. FORESTA: And you cannot instruct this  
23 nonparty witness not to answer a question.

24 Dr. Wecker, if you adhere to the instruction of

1 counsel and don't answer this, I will move to have this  
2 deposition reopened, and we will have you come back  
3 again. I'm entitled to an answer to that question.

4 MR. BURTON: We're not going to have threats to  
5 the witness, Steve. If you're going to do that, I'm  
6 going to shut it down right now.

7 MR. FORESTA: It's not a threat to the witness.  
8 He is not your client; you cannot instruct him to do  
9 that.

10 MR. UGARTE: I'm going to note for the record  
11 that in past depositions your firm has shut down  
12 depositions on the grounds of being outside of the  
13 scope, for the record. If you want to pursue that,  
14 you're entitled to it. But you're not going outside of  
15 the scope of this deposition here.

16 MR. FORESTA: It's not outside the scope of the  
17 deposition. I'm entitled to know whether in formulating  
18 his opinions, as set forth in the supplemental exhibit,  
19 he considered anything other than the COMMIT study.

20 MR. BURTON: You've asked him that question --

21 MR. MINTON: It's a different question. He can  
22 answer that.

23 MR. BURTON: -- and he said that he limited  
24 this report to the COMMIT data, but that he was

1 questioned about it in connection with his original  
2 report and there was data there.

3 MR. FORESTA: That's a different issue. That's  
4 a different issue. What I want to know now is whether  
5 he is aware of any studies in the medical literature  
6 that show that a campaign of smoking education can have  
7 an impact on quit rates.

8 MR. UGARTE: I'd like to go off the record for  
9 five minutes, if possible.

10 MR. FORESTA: You want Dr. Wecker here for  
11 this?

12 MR. UGARTE: No. Dr. Wecker, you can stay  
13 here. I think we should leave to make it easier. Off  
14 the record.

15 THE VIDEOGRAPHER: The time is 5:36. We're  
16 going off the videotaped record.

17 (Recess.)

18 THE VIDEOGRAPHER: The time is 5:58, and we're  
19 back on the videotaped record.

20 BY MR. FORESTA:

21 Q All right, Dr. Wecker, we're back on the  
22 record. And before the lawyers started doing what  
23 lawyers do best, I asked you whether you believe that  
24 education about smoking can have an effect on smoking

1 quit rates, and your answer was that, from the evidence  
2 that you've seen, it appears that that -- it does not.  
3 Is that a fair characterization of your testimony or  
4 your response to my question?

5 A I thought I mentioned the evidence that I was  
6 talking about in this deposition from the COMMIT study.  
7 But with that inclusion, I believe that's what I told  
8 you.

9 Q And that's what I want to find out. When you  
10 use the word "evidence," "from the evidence" in that  
11 response, are you talking about evidence relating to the  
12 COMMIT study?

13 MR. BURTON: I'm going to object to the form.  
14 Are you talking about his opinion, Steve, as reflected  
15 in the supplemental report exclusively, or are you  
16 asking a broader question?

17 MR. FORESTA: What I really want to find out,  
18 Dal, is whether, in response to my question, he was  
19 limiting it to, for all intents and purposes, the  
20 opinions in this supplemental report which has to do  
21 with the COMMIT study.

22 MR. BURTON: Why don't we have the question  
23 again so Dr. Wecker can focus on it.

24 (Record read.)

1 THE WITNESS: Well, that seems like an  
2 elaboration of a larger question, so without specific  
3 reference to the earlier question, I'll see if I can be  
4 helpful here, if that's all right.

5 BY MR. FORESTA:

6 Q Please.

7 A Certainly at one point in your questioning a  
8 few minutes ago, when I referred to evidence about quit  
9 rates, I was talking about the subject of this  
10 deposition which is my study of the COMMIT data, and  
11 what it has to say about quit rates, and how they  
12 respond, or not, to interventions. We're all aware that  
13 I've been through -- I'm not sure I can count them, but  
14 two or three other depositions here, and much of those  
15 matters that were discussed there had to do with quit  
16 rates. But what they didn't have to do with was the new  
17 material here on the -- with the COMMIT data, because  
18 that's data that I didn't have then and do have now.

19 So without going back and reviewing the  
20 material from other depositions but limiting myself to  
21 the material that I've prepared to discuss with you  
22 today, then I would, with that limitation, be talking  
23 about the COMMIT data.

24 Q Dr. Wecker, to what extent, if any, are you

1 relying on studies other than published studies relating  
2 to COMMIT in formulating the opinions that are set forth  
3 in Exhibit 1?

4 A What's Exhibit 1?

5 Q Your supplemental expert report.

6 A Okay. Just a minute.

7 The only database responsive to your question  
8 here pertaining to Exhibit 1 is the COMMIT database.

9 Q Okay. And my question was a little bit  
10 different than that. It asked whether there were any  
11 published studies relating to -- or other than those  
12 relating to the COMMIT study that you relied upon in  
13 formulating the opinions set forth in your supplemental  
14 expert report.

15 A Well, I mentioned some other materials that I  
16 had reviewed, such as the CDC article that summarizes  
17 COMMIT and a number of other studies, but I think I  
18 would take that as just part of my general background  
19 that I incorporated into my understanding in doing this  
20 work. And I mentioned the surgeon general 2000 report,  
21 so those -- just to take that example, the surgeon  
22 general 2000 report is not just a COMMIT study report,  
23 it's a bit broader than that. But again, I think those  
24 were broadening researches by me in background. When it



1 comes down to the actual calculations, I'm really only  
2 working with the COMMIT data, as far as Exhibit 1 is  
3 concerned.

4 Q But in terms of figuring out what calculations  
5 to do, you also rely on the CDC report that you  
6 discussed previously; isn't that correct?

7 A In one aspect. Generally not. But in that one  
8 calculation where I simply implemented the  
9 CDC-recommended method, that would be true. But that's  
10 the only place where that calculation shows up.

11 Q Is there a reason why you didn't implement the  
12 CDC-recommended calculations in any of the other  
13 calculations you ran?

14 A I hadn't read the CDC report when I did the  
15 others.

16 Q And is it your testimony that the first time  
17 you conducted the evaluation that was provided to us  
18 that -- excuse me, let's strike that.

19 Is it your testimony that the first time you  
20 ran the calculation that was provided to us yesterday  
21 was after the December 4th deadline --

22 A Yes.

23 Q -- for submitting your expert report?

24 A Actually, I think -- that's true, but I believe

1 I also said I think I might have run it yesterday or the  
2 day before but not earlier, just a couple days ago.

3 Q And that was the first time?

4 A Yes.

5 Q Can you turn to your supplemental report,  
6 please, Exhibit No. 1.

7 A Okay.

8 Q You state in this report, on the first page,  
9 that you have two principal conclusions drawn from your  
10 review of the materials, analysis and calculations  
11 referenced in Dr. Cummings' September 22, 2000 report?

12 A Just a moment, let me catch up here. Okay.

13 Q The first principal conclusion that you draw,  
14 Dr. Wecker, is that Dr. Cummings' estimate of the effect  
15 of education about smoking on the smoking quit rate  
16 based on his analysis of the COMMIT data is  
17 statistically flawed and overstated; correct?

18 A Yes.

19 Q And the second principal conclusion that you  
20 draw based on your review of the materials referenced in  
21 Dr. Cummings' report is that Dr. Cummings' estimate of  
22 the effect of education about smoking on smoking quit  
23 rates contradicts Dr. Harris's estimated effect of  
24 information about smoking on smoking quit rates and

1 shows that Dr. Harris's smoking "attributable," in  
2 quotes, claims estimate is overstated. Is that correct?

3 A Yes.

4 Q Are there any other conclusions that you've  
5 drawn based on your review of Dr. Cummings' September  
6 22, 2000 report?

7 A No other principal conclusions. This is just  
8 an introductory paragraph. The report then continues  
9 with the details.

10 Q Okay. I just want to make sure there isn't  
11 anything that was left out of this report.

12 Q When was the last time that you reviewed this  
13 report, Dr. Wecker?

14 A I'm not sure if I looked at it today or not.  
15 It's getting a little late in the day here, but I may  
16 have looked at it today, and possibly I looked at it  
17 yesterday. I just don't recall.

18 Q Is there anything contained in this report,  
19 Dr. Wecker, that you know not to be correct?

20 A No. I don't know of anything that's incorrect  
21 in here.

22 Q All right. Your first principal conclusion, if  
23 I understand it correct -- there are two parts to it.  
24 First, that Dr. Cummings' estimate of the effect of

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1 education about smoking on smoking quit rates, based on  
2 his analysis of the COMMIT data, is, quote unquote,  
3 statistically flawed; correct?

4 A Yes.

5 Q And the second part of that first principal  
6 opinion is that Dr. Cummings' estimate of the effect of  
7 education about smoking on the smoking quit rate, based  
8 on his analysis of the COMMIT data, is, quote,  
9 overstated, end quote; is that correct?

10 A Yes.

11 Q I want to start with the second component of  
12 that, your opinion that his estimate is overstated, and  
13 ask you, what is the basis for that opinion?

14 A Well, that's -- that whole section that, for  
15 the next couple of pages, let me -- do you want me to  
16 pull out the portions of this following pages that  
17 relate to that sentence fragment; is that what you want  
18 to do?

19 Q No, what I want to find out is whether there is  
20 any basis for that conclusion that is not set forth in  
21 your expert report. And if you tell me that the basis  
22 for that opinion is the material that follows on the  
23 succeeding pages, then I will accept that answer.

24 A Well, it is. Although you have to bear in mind

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1 that that succeeding page is then -- point to footnotes  
2 in reference materials, but with all that well  
3 understood, my report is, I believe, complete.

4 Q What is your estimate of the effect of  
5 education about smoking on smoking quit rates based on  
6 the COMMIT data?

7 A I didn't understand what you meant.

8 Q Do you have an estimate of the effect of  
9 education about smoking on the quit rates based on the  
10 COMMIT data?

11 A Yes.

12 Q And what is your estimate?

13 A Well, I believe there was no significant effect  
14 of the intervention on quit rates.

15 MR. FORESTA: Michael Chang, are you there?

16 MR. CHANG: Yeah.

17 MR. FORESTA: Do you have a document entitled  
18 "Supplement to Expert Witness Report Prepared by: K.  
19 Michael Cummings," dated September 22, 2000?

20 MR. CHANG: Yes, I do.

21 MR. FORESTA: Can you hand that to the court  
22 reporter to be marked as the next exhibit, please.

23 MR. CHANG: Yeah, sure.

24 (Deposition Exhibit 18 was marked for

1 identification by the court reporter.)

2 BY MR. FORESTA:

3 Q Do you have that, Dr. Wecker?

4 A Yes.

5 Q And I believe you testified earlier that you  
6 have reviewed this document before?

7 A Yes.

8 Q And this was a document that was provided to  
9 you, I believe you testified, by Mr. Leibenstein?

10 A Well, I wasn't sure about that, but I think --  
11 it certainly came from -- through counsel. I didn't  
12 open the package, so I wasn't sure exactly who mailed  
13 it.

14 Q I'd like you to turn to page 24 of the Cummings  
15 supplemental report, Exhibit 18.

16 A Okay.

17 Q Let me direct your attention to paragraph 10.3;  
18 do you see that?

19 A Yes.

20 Q Dr. Cummings writes in that paragraph, this is  
21 the second sentence, for your information, quote, "The  
22 COMMIT study demonstrated that education about smoking  
23 can increase quit rates in a population."

24 Do you agree with that statement, Dr. Wecker?

1 A I don't. I don't believe it did demonstrate  
2 that.

3 Q Dr. Cummings goes on to say, "The COMMIT  
4 education program was successful in significantly  
5 boosting quit rates by 1.8% overall."

6 Do you agree with that statement?

7 A I would disagree with that statement as well.

8 Q Dr. Cummings says, "The COMMIT education  
9 program was found to be most effective in increasing  
10 cessation rates in those with less years of formal  
11 education (i.e., non-college graduates)."

12 Do you agree with that statement?

13 A Well, I guess I get off the train here on the  
14 premise, since I don't agree that it had an effect, let  
15 alone more on one group and less on others. When I look  
16 at the data, I don't see any significant effect here.

17 Q On any group that was studied in the COMMIT  
18 study; is that correct?

19 A Well, I was -- I wasn't thinking that broadly.  
20 I was thinking in the context of this paragraph, where  
21 we just got done talking about the 1.8 percent, and I  
22 thought the next sentence was really continuing with  
23 that context. And since I got off the train on the  
24 previous sentence, I thought that elaborations of that

1 point would be affected by the fact that I don't agree  
2 with the main point.

3 Q You're familiar with the COMMIT data, are you  
4 not?

5 A Generally, yes, I've analyzed some of it,  
6 and -- what do you mean?

7 Q Well, as a general proposition, not focusing on  
8 Dr. Cummings' opinion that the education program  
9 significantly boosted quit rates by 1.8 percent, I want  
10 to ask you, do you agree that the COMMIT education  
11 program was found to be most effective in increasing  
12 cessation rates in those with less years of formal  
13 education, i.e., non-college graduates?

14 MR. BURTON: Steve, are you talking about  
15 regardless of gender or regardless of level of smoking,  
16 or were you being more precise?

17 MR. FORESTA: Talking about people with less  
18 years of formal education, i.e., non-college graduates,  
19 whether they're women, men, anything.

20 MR. BURTON: Regardless of how much they smoke?

21 MR. FORESTA: General proposition.

22 Q Was the COMMIT study more successful in  
23 increasing cessation rates in those with less years of  
24 formal education? You know what? I'm going to strike



1 that, because that's changing what it says here in the  
2 report.

3 Was the COMMIT education program found to be  
4 most effective in increasing cessation rates in those  
5 with less years of formal education, i.e., non-college  
6 graduates?

7 A Well, I'm trying to think of what an analysis I  
8 have here that might help with that, and perhaps the one  
9 that comes most to mind is the analysis I did  
10 restricting to blue-collar participants in the study.

11 Q Why is that?

12 A Because I'm going to suppose they tend to have  
13 less education than lawyers like yourself.

14 Q Did you do an analysis of participants in the  
15 COMMIT education program who did not have non-college  
16 graduate degrees?

17 MR. BURTON: Object to the form.

18 BY MR. FORESTA:

19 Q Who did not have college degrees.

20 A Well, I was -- certainly some of -- the way you  
21 pose the question, of course, because there's some of  
22 everything in that data set. But I think you meant  
23 non-college degrees and leave out the other folks, as  
24 opposed to just have them be a part of it. And the

1 closest thing that I can think of right now to that was  
2 the blue-collar analysis that I was mentioning.

3 Q That is a different analysis than doing an  
4 analysis of COMMIT study participants who are  
5 non-college graduates; would you agree with that?

6 A Yes, I agree, it's not the same thing, but I  
7 thought it was responsive because it seems to be  
8 essentially on that point.

9 Q All right. But you did not do a study limited  
10 solely to the sample with a population of COMMIT study  
11 participants who are non-college graduates; am I  
12 correct?

13 MR. UGARTE: Objection.

14 MR. MINTON: Yeah, I object to the form. What  
15 do you mean by "study"? You mean any logistic  
16 regression analysis? Any anything?

17 BY MR. FORESTA:

18 Q Any analysis that you did, Dr. Wecker, focusing  
19 on the quit rates for COMMIT-studied participants with  
20 less years of formal education, i.e., non-college  
21 graduates; did you study that subset?

22 A Well, let me see if there's something else in  
23 here other than the blue-collar analysis I mentioned  
24 that is not quite -- I acknowledge not quite the same

1 thing as you're saying, but I think in fairness it's  
2 similar. Let me just take a moment.

3 MR. UGARTE: I'm going to also object to the  
4 form of that question, particularly to the extent that  
5 there is -- any of the tabbed references that deal with  
6 that issue.

7 MR. FORESTA: Why did my question presume that  
8 he was not allowed to look at any of the tabbed  
9 information? He can look at whatever he wants. I'm  
10 asking him the question. You don't need to direct him  
11 where to look. He's prepared the documents, Rich. He  
12 knows where to look.

13 MR. UGARTE: That was not intended to prepare  
14 him where to look. What you're trying to do is describe  
15 the study that he conducted as not having to do with  
16 education, and I'm simply pointing out that his report  
17 is an analysis of that issue, as well as the blue-collar  
18 male issue.

19 BY MR. FORESTA:

20 Q Dr. Wecker, you did an analysis of the  
21 COMMIT --

22 MR. MINTON: Wait. Hold it. Wait. Stop.  
23 He's looking.

24 THE WITNESS: I was looking. I hadn't found

1 it. I can't help but perk up when I overhear the lawyer  
2 suggesting it's in here but I've missed it. It's  
3 getting late in the day, but I didn't notice it.

4 MR. UGARTE: Doctor, I am not suggesting it's  
5 in it. I just think that the question is unfair in that  
6 there is a binder of information there that no one in  
7 this room has, and I feel that I just want to make it  
8 clear for the record that plaintiffs' counsel will be  
9 provided with that data; in fact, has that data in front  
10 of him. And so I don't want them to misrepresent the  
11 record here.

12 MR. FORESTA: I don't have the data in front of  
13 me.

14 Q And the reason why I'm asking you, Dr. Wecker,  
15 is because we don't have a full set of the information.  
16 I wish that we did. What I just want to know from you  
17 is whether you ran any analysis or any calculations on  
18 quit rates as they applied to what is referred to in  
19 this report as "COMMIT education program participants  
20 with less years of formal education, i.e., non-college  
21 graduates."

22 A Okay, let me make a short comment and then  
23 answer that. As to whether you have what I have, you  
24 really do. That -- all I have here that I was looking

1 through is -- this binder is a printout of materials  
2 that you've already been provided on -- in computer  
3 form. So you really do have what I have.

4 But as to the question, I don't see -- I was  
5 looking, just in case I had it. I didn't see, and I  
6 don't believe I overlooked it, a study that was limited  
7 to individuals with -- I think you said no college  
8 education or something like that. I remember looking at  
9 that, and so I thought I might find something on that,  
10 but I didn't find it in flipping through.

11 Q So the only basis that you have for disagreeing  
12 with the statement that the COMMIT education program was  
13 found to be most effective in increasing cessation rates  
14 in those with less years of formal education is your  
15 knowledge of the cessation rates or the quit rates as  
16 they were observed in blue-collar workers; is that  
17 correct?

18 MR. BURTON: Object to the form.

19 THE WITNESS: That's correct. That's what came  
20 to mind. But I have such a sharp recollection of  
21 looking at the different education levels, I'm wondering  
22 why I don't see it. So maybe I should look a little bit  
23 more closely, because I thought I might have done  
24 something like that. But let me just take a second and

1 see if I can find something like that.

2 Okay, I found what I vaguely remembered, and so  
3 I can point it out to you.

4 BY MR. FORESTA:

5 Q Okay.

6 A In the tab 65 materials, I have an analysis,  
7 and there may be other places like this, but here's one  
8 I found, where I look at the COMMIT data, but I also  
9 include a variable for education, and I see no different  
10 effect for different levels of education on quitting.

11 Q Going back to Exhibit 11, Dr. Wecker, which is  
12 the printout of the file directories --

13 A Just a second.

14 Q Sure.

15 A Okay.

16 Q Can you point me to a specific file in that tab  
17 65 folder that reflects the information that you just  
18 testified to?

19 A Okay, just a second. Okay, the  
20 second-to-the-last file, nqr3s\_commit.log

21 Q What is that an analysis of, Dr. Wecker?

22 A That's the analysis of the COMMIT data where  
23 one aspect of the analysis is to include variables for  
24 different education level.

1 Q Okay. Can I ask you to turn to the 1995  
2 report, Exhibit 2.

3 A Okay.

4 Q And if you'd turn in particular to page 189 --

5 A Okay.

6 Q -- in the section in the first column entitled  
7 "Discussion."

8 A Okay.

9 Q The first sentence says, "The COMMIT  
10 intervention did not significantly affect the primary  
11 outcome measure -- quit rates among heavy smokers --  
12 where quitting was defined as having smoked no  
13 cigarettes for at least the preceding 6 months at the  
14 end of the trial." Do you see that?

15 A Yes.

16 Q Do you agree with that statement?

17 A Yes.

18 Q If you take a look in that same column, move to  
19 the next paragraph, it says, "There was, however, a  
20 statistically significant intervention effect in the  
21 light-to-moderate smoker cohort -- quit rates of 0.306  
22 versus 0.275 -- with the mean difference showing an  
23 additional 3% of such smokers quitting." Do you agree  
24 with that statement?

1 A Well, I'm going to have to look here. I  
2 believe all of the analysis I have is on the combined  
3 group rather than breaking them apart, but let me take a  
4 second and see if I have something on that.

5 Q Okay.

6 A Oh, yes, okay, I found something here, and I'll  
7 tell you about it, if you want.

8 Q Yes, please.

9 A I'm looking in the materials in my tab 70, and  
10 the first thing I'll point out is that this is yet  
11 another place where I have an analysis that involves  
12 different levels of education, but it's essentially the  
13 same kind of thing I told you about, but it's a  
14 different computer output. Then, that same -- just  
15 turning the page, then we -- I have here a number of  
16 cigarettes smoked daily, and I don't see any significant  
17 effects from -- let me look here for a second. Okay.  
18 I'm just analyzing this output. I see a difference in  
19 quit rates as between heavy and light smokers, but I  
20 don't see it as arising from the intervention.

21 Q You see it -- I'm sorry, you see a difference  
22 in quit rates between the population that was subjected  
23 to the intervention and the comparison group; is that  
24 what you're saying?



1 A No, I do not. I didn't say that.

2 Q What is the difference that you see in your  
3 data?

4 A I see that there's higher quit rates among  
5 light smokers compared to heavy smokers. That seems to  
6 be true here on the data, but that doesn't seem to be  
7 explained by the intervention.

8 Q Okay.

9 A Apparently it's just a difference in the  
10 population.

11 Q Here's my question. I'm sorry, did you finish  
12 your answer?

13 A Go ahead.

14 Q Here's my question to you: Do you dispute,  
15 Dr. Wecker, that there was "a statistically significant  
16 intervention effect in the light-to-moderate smoker  
17 cohort -- quit rates of 0.306 versus 0.275 -- with the  
18 mean difference showing an additional 3% of such smokers  
19 quitting"; do you disagree with that statement?

20 A Yes, my analysis here doesn't show that. And  
21 I'm referring here to the material in tab 70.

22 Q And tab 70 was an analysis of the difference in  
23 quit rates between the intervention cohort and the  
24 comparison cohort focusing specifically on

1 light-to-moderate smokers; is that correct?

2 A It included a variable for more than 25  
3 cigarettes a day, 15 to 24, 5 to 14, and less than 5.

4 Q Did you run an analysis, Dr. Wecker, to  
5 determine whether there was a statistically significant  
6 difference in the quit rates for light-to-moderate  
7 smokers in the COMMIT study?

8 MR. BURTON: Object to the form.

9 THE WITNESS: I ran the analysis I'm describing  
10 to you, and it shows no such effect.

11 BY MR. FORESTA:

12 Q And this is the analysis that's set forth in  
13 tab 70; correct?

14 A That's right.

15 Q And is the disclosed spreadsheet, Exhibit 12 to  
16 your deposition, a summary of the output of those  
17 calculations?

18 A Just a moment. Yes.

19 Q Can you point to me where on this Exhibit 12 in  
20 this chart there is a reference to the difference in  
21 quit rates between the light-to-heavy -- excuse me,  
22 light-to-moderate smokers in the intervention group  
23 versus the comparison group?

24 A It's hard to point. You're in New York. How

1 do we want to do this?

2 Q Well, why don't we start with which page it's  
3 on.

4 A First page. I'm sorry, I took the "point"  
5 literally. It's late in the day. I can direct you to  
6 it, and I assume that's what you mean.

7 Q That's what I mean.

8 A Yeah. The first page, up at the top, where  
9 you'll see, on the left side, it says "Comparison" and  
10 "Intervention."

11 Q Yes.

12 A And then you want to move over toward the  
13 middle, and you'll see a column heading called  
14 "P-value," and below that --

15 Q Yes.

16 A a number, .11, and that's what's telling us  
17 there's no significant effect here. And in --

18 Q Where does it make any reference to  
19 light-to-moderate smokers?

20 A That's one of the variables that is a part of  
21 this analysis, and you don't see that until you turn the  
22 second page, and it's at the top.

23 Q Okay. The second page at the top it says  
24 "Cigarettes smoked daily in 1988." That is an analysis

1 that you ran to compare the quit rates -- or that's a  
2 reflection of the analysis that you ran to compare the  
3 quit rates in the light-to-moderate smokers group?

4 A Yes, that's a variable that reflects the  
5 intensity of smoking, and that's what the  
6 "light-to-moderate" and "heavy" concept is all about.

7 You guys probably got to eat dinner before you  
8 started this. We didn't. Can you give me a schedule?

9 Q Yeah. Well, we can break for a bite to eat,  
10 but let me just finish the questions on this, because I  
11 don't understand some of this information.

12 In the category for cigarettes smoked daily in  
13 1988, in that subsection, it is broken down by the  
14 amount of cigarettes smoked per day, smoked daily in  
15 1988; correct?

16 A Yes.

17 Q And the light-to-moderate smokers are covered  
18 in the categories 5 to 14 cigarettes smoked daily, and  
19 less than 5 cigarettes smoked daily; correct?

20 A The light-to-moderate labeling is not part of  
21 this. This variable simply has the elemental  
22 information of number of cigarettes smoked daily.

23 Q And all of this information comes from the 1997  
24 study which is a study assessing predictors of smoking

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1 cessation; correct?

2 A No, this data comes from the COMMIT data.

3 Q All right. I'm just looking at the first page  
4 in the title, "Falise: Predictors of Smoking Cessation  
5 Between 1988 and 1993 as Reported by Hymowitz (1997;  
6 Table 2)." I think you testified before that this, at  
7 least in the first two columns, is a duplication or a  
8 replication of the first two columns of Table 2 in the  
9 '97 report, isn't that correct?

10 A That's true, but what I tried to be clear about  
11 is that's not where the data comes from. I thought you  
12 asked -- I don't want to quarrel, but I thought your  
13 question had to do with where the data comes from. The  
14 data doesn't come from that article; it comes from the  
15 CDs.

16 Q The 1997 article, however, does not compare or  
17 does not evaluate the effect of the COMMIT intervention  
18 on smoking quit rates; isn't that correct?

19 A I don't -- I thought it did. I don't  
20 understand what you mean.

21 Q It's your testimony that the 1997 study is an  
22 evaluation of the effect of COMMIT intervention on quit  
23 rates; is that your testimony?

24 A Your question so puzzles me. I'm trying to

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1 figure out what you could possibly mean. This is -- the  
2 '97 article is just one more article in the COMMIT  
3 series, and the COMMIT study is certainly about quit  
4 rates. So I must be missing something. Why do you  
5 think it is not? I don't mean to ask you a question.

6 BY MR. FORESTA:

7 Q Dr. Wecker -- I'm sorry, did you finish your  
8 answer?

9 A I'm finishing the answer, but mostly I'm  
10 indicating I must not understand the question.

11 Q Okay. Isn't it true, Dr. Wecker, that the  
12 purpose of the 1997 study was to identify variables  
13 predictive of smoking cessation in a cohort of cigarette  
14 smokers followed for five years?

15 A Well, I don't see where you're reading, but I'm  
16 looking at the front page here where it says  
17 "Objectives," and the objectives, it says, are "The  
18 primary hypothesis of COMMIT" -- I'll skip the  
19 parentheses -- "was that a community-level,  
20 multichannel, 4-year intervention would increase quit  
21 rates among cigarette smokers, with heavy smokers (more  
22 than 25 cigarettes per day) of priority." That's what  
23 the objective is.

24 Q Are you reading from the 1997 study or the 1995

1 study?

2 A Oh, sorry, I'm on the wrong study. Let's start  
3 this over again. No wonder I'm lost.

4 Q Well, all right. You were reading from the  
5 1995 study?

6 A Yes, I was on -- I think you were asking about  
7 the other one, so I'll go to the other one. So can we  
8 start over on this?

9 Q Yes. It is a fact, Dr. Wecker, isn't it, that  
10 the objective of the 1997 study was to identify  
11 variables predictive of smoking cessation in a cohort of  
12 cigarette smokers followed for five years?

13 A Yes.

14 Q And the purpose of the 1995 study was to  
15 evaluate or assess the effect of a smoking education  
16 program on quit rates observed in an intervention group  
17 and a comparison group; isn't that correct?

18 A I agree, except I think I'd call it  
19 intervention. You said education, and, of course, the  
20 intervention included more than that, but basically I  
21 agree.

22 Q Okay. Before we get into too much more detail  
23 in the '95 and '97 study, I understand you'd like to  
24 take a break to grab something to eat.

1 A Well, it depends on what your schedule is.  
2 It's going on 10 o'clock where you are. I don't know  
3 how much longer you want to go.

4 Q Well, I'd like to go until I finish, and I  
5 think that's going to be about another hour of  
6 questioning.

7 A If you do an hour, I'll keep going, and you can  
8 get to sleep earlier, and I can go home.

9 MR. FORESTA: Good. Can we just take a quick  
10 five-minute break, though, and I will take care of  
11 business here?

12 THE WITNESS: Sure.

13 THE VIDEOGRAPHER: The time is 6:43, and we're  
14 going off the videotaped record.

15 (Recess.)

16 THE VIDEOGRAPHER: This marks the beginning of  
17 Videotape No. 3 in the deposition of William Wecker.  
18 The time is 7:00 p.m., and we're back on the videotaped  
19 record.

20 BY MR. FORESTA:

21 Q Dr. Wecker, when you ran your calculations  
22 yesterday on the COMMIT data using the CDC-recommended  
23 method, did you find a difference in the quit rates  
24 between those people involved in the COMMIT



1 interventions versus the comparison group?

2 A Yes, but not a significant one.

3 Q What was the difference that you found?

4 A .011.

5 Q .011?

6 A Yes.

7 Q And is it your testimony that that was not a  
8 statistically significant finding?

9 A That's correct.

10 Q In running that calculation that resulted in a  
11 finding of .011 difference, did you consider the entire  
12 population of 20,000-plus people in the COMMIT study?

13 MR. MINTON: Object to the form.

14 THE WITNESS: Let me see if I have a sample  
15 size here, but I think that's about the right number. I  
16 just don't see it printed out. 20,000 is the right  
17 neighborhood. I've got the numbers here by city. It  
18 would take five minutes, but I could add them up, but  
19 you can add them up yourself, if you want. It's in tab  
20 74.

21 BY MR. FORESTA:

22 Q Tab 74 it's in?

23 A Yes.

24 Q No, you don't need to do that calculation right

1 now.

2 A Let me tell you, during the break I had a  
3 moment, and I found the analysis I was looking for  
4 earlier, on the individuals with no college that you  
5 were asking about.

6 Q Okay, where does that exist?

7 A It's buried in tab 70, on the ninth page, as I  
8 printed it out, but it's part of the file cascade.lst.

9 Q Could you turn to your expert report, which is  
10 Exhibit 1?

11 A Okay.

12 Q In particular, page 2.

13 A Okay, I have it.

14 Q You state, in the second sentence under Roman  
15 numeral I, that Dr. Cummings' 1995 published analysis  
16 was refined in his 1997 published analysis by  
17 considering other factors that influenced the smoking  
18 quit rates such as gender, age, income and alcohol use.  
19 Do you see that?

20 A Yes.

21 Q Is it your opinion, Dr. Wecker, that the 1997  
22 report is a refinement of the '95 study?

23 A Yes, I think that's -- it's a generalization,  
24 but it's fair, I think.

1 Q Well, is there anywhere in the 1997 report,  
2 which is Exhibit 3, where it says, "This is a refinement  
3 of the '95 study"?

4 A I -- if you want me to take the time to look, I  
5 can do that, but I didn't mean to be quoting it. I was  
6 giving you my impression that -- whereas in the '95  
7 study, they did not employ any correction for  
8 confounding variables. In the '97 study, they quite  
9 sensibly go ahead and do that, so I would call that a  
10 refinement. If you want me to take the time, I'll look  
11 and see if it's -- they use that word, but it doesn't  
12 seem like --

13 Q Let me ask you a different question. Isn't it  
14 true, Dr. Wecker, that the purpose of the '95 study and  
15 the '97 study are different?

16 A Just a second, we'll get this phone out of the  
17 way.

18 (Interruption in the proceedings.)

19 THE WITNESS: Well, there are similarities and  
20 differences, they're both talking about exactly the same  
21 study, and they -- so in that sense, there's similarity.  
22 And then the '97 study goes on to do more than the '95  
23 study had done.

24 BY MR. FORESTA:

1 Q The 1995 study is an effort to evaluate the  
2 effect of an intervention program on smoking quit rates;  
3 correct?

4 A '95?

5 Q Yes.

6 A Yes.

7 Q And the 1997 study -- the purpose of the 1997  
8 study is to identify variables predictive of smoking  
9 cessation in a cohort of cigarette smokers followed for  
10 five years, isn't that correct?

11 A You're reading correctly, but it's the same  
12 cohort. They're both talking about the same people, the  
13 same study.

14 Q The purpose of the analysis in the 1995 study  
15 is different than the purpose of the analysis in the  
16 1997 study, isn't that correct?

17 A I've answered that. I'd say there are  
18 similarities, strong similarities, and there are some  
19 differences. Obviously it's -- the '97 study picks up  
20 where the '95 study leaves off and does some more  
21 things. I grant you that.

22 Q Dr. Wecker, the purpose of the 1997 study was  
23 not to reevaluate the effect of the smoking education  
24 program on smoking quit rates, was it?

1 A Well, you've read part of the abstract that  
2 talks about the objective. The objective being to -- to  
3 employ these other predictive variables, but you need to  
4 realize that -- what are they predicting? They're  
5 predicting the smoking quit rates, so it's not like  
6 they've moved on to a new topic. This is all the same  
7 people, same subject, quit rates in the intervention  
8 versus the nonintervention communities.

9 MR. FORESTA: Can you read my question back,  
10 please, Madam Court Reporter.

11 (Record read.)

12 BY MR. FORESTA:

13 Q Can you answer that question, sir?

14 MR. UGARTE: Objection. Asked and answered.

15 MR. MINTON: Objection. Asked and answered.

16 MR. FORESTA: No, it wasn't.

17 Q Can you answer that question, Dr. Wecker?

18 A Yes.

19 MR. MINTON: Same objection.

20 THE WITNESS: I thought I was clear enough  
21 already, but I'll try it another way.

22 Both papers are talking about exactly the same  
23 thing, the smoking quit rates in this particular study  
24 that goes by the name of COMMIT. They both are

1 addressing the effect of the intervention. One of them,  
2 the '97 study, is a little more refined in that it goes  
3 on to employ some additional variables. That's my  
4 reading of these -- the relationship of these two  
5 studies.

6 BY MR. FORESTA:

7 Q Dr. Wecker, the effect of the COMMIT  
8 intervention was not one of the many predictors of quit  
9 rates that was evaluated in the 1997 study, was it?

10 A Oh, yes, it was. It wasn't printed out, but it  
11 certainly was.

12 Q Show me where in the 1997 report there is a  
13 reference to the COMMIT intervention as a predictor of  
14 quit rates?

15 A Page S60 at the bottom of Table 2, where you  
16 can read "Adjusted for COMMIT intervention status."  
17 That --

18 Q Before -- I'm sorry.

19 A Let me finish that up. That's referring to the  
20 COMMIT intervention status variable.

21 Q Can you take a look at page S58, please, in the  
22 second column, about three-quarters of the way down.

23 A Okay.

24 Q There's a sentence that says, "The effect of

1 the COMMIT intervention on the quit rates among cohort  
2 members has been described elsewhere." Do you see that?

3 A Not yet. Which paragraph heading is it?

4 Q "Analysis Methods."

5 A Okay, just a minute.

6 MR. MINTON: What else is on that page, because  
7 the page numbers don't really come through on the copy  
8 we have.

9 MR. FORESTA: It's actually the second page of  
10 the study. In the upper left-hand corner it says  
11 "Methods," in bold.

12 MR. MINTON: Got it.

13 BY MR. FORESTA:

14 Q Did you find the section I was talking about,  
15 Dr. Wecker?

16 A No. I've got the right page, I think, but I  
17 didn't see the part you were reading.

18 Q Okay. Do you see two-thirds of the way down on  
19 the right-hand column, there's a heading that says  
20 "Analysis Methods"?

21 A Yes.

22 Q If you go down ten lines, the tenth line starts  
23 with the word "smoking"; do you see that?

24 A Yes.

1 Q The first full sentence on that line states,  
2 "The effect of the COMMIT intervention on the quit rates  
3 among cohort members has been described elsewhere."

4 A Yes.

5 Q Do you see that?

6 A Yes, I agree with that.

7 Q Okay. If you move down another five lines,  
8 it's a line that starts with the word "of less" -- the  
9 words "of less."

10 A Okay.

11 Q You see the sentence that says, "To take  
12 account of this effect, the relationship between  
13 individual-level predictors of smoking cessation are  
14 adjusted for the effects of the COMMIT intervention"?  
15 You understand that that is what the authors of the 1997  
16 study did; they adjusted for the effect of the COMMIT  
17 intervention before considering the other variable  
18 predictors that are assessed in this study; isn't that  
19 correct?

20 A No, that's not the way they did it. Just a  
21 minute, I dropped the microphone.

22 No, I don't think I can accept your explanation  
23 of what they did, so why don't you ask another question.

24 Q Why don't you tell me, Dr. Wecker, what it is

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1 that they did to account for the COMMIT intervention?

2 A They just included it as a variable, along with  
3 all the others, as makes -- the only thing that makes  
4 sense here.

5 Q What was the relative risk of -- strike that  
6 question.

7 What is the data that was derived from this  
8 study for the population involved in the COMMIT  
9 intervention? Where is that listed on Table 2?

10 MR. BURTON: Objection.

11 THE WITNESS: I don't understand the question.

12 BY MR. FORESTA:

13 Q Do you see Table 2, which is -- appears on page  
14 S60?

15 A Yes.

16 Q And Table 2 sets forth a series of  
17 characteristics that were analyzed by the study authors;  
18 correct?

19 A Yes, these are the right-hand side variables  
20 that they looked at.

21 Q And those include things like sex, age, race  
22 annual household income, and other things; correct?

23 A Yes.

24 Q Where do you see the characteristic

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1 "participation in COMMIT intervention"?

2 A Well, you see that in the footnote, where it  
3 says "Adjusted for COMMIT intervention status."

4 Q The entire regression analysis was adjusted for  
5 participation in the COMMIT intervention; isn't that  
6 correct?

7 A That's true, just as it was -- the entire  
8 regression analysis was adjusted for sex or age or race  
9 or any of the other variables.

10 Q And what are the results that they found after  
11 they adjusted it for the COMMIT intervention status?

12 A Which results? I don't understand.

13 Q The results when they did the regression  
14 analysis for -- and considered the characteristic  
15 "COMMIT intervention status."

16 A Yes. Well, you're looking at some of the  
17 results right here in Table 2. Is there a particular  
18 result?

19 Q I'm looking at --

20 MR. FORESTA: Are you asking what was the odds  
21 ratio for not being in an intervention community?

22 MR. FORESTA: That's a far more specific  
23 question than I asked, Mike.

24 Q But what I want to know now is: Where can I

1 find the results that relate specifically to COMMIT  
2 intervention status?

3 A You can look at my replication on -- let me  
4 find it here. Actually, we've talked about it before.  
5 You and I were discussing tab 70, the first page, and so  
6 we've already been to this spot.

7 Q Okay. Where in the article, the 1997 article,  
8 do you find those results?

9 A Well, all of the results for the variables  
10 printed in Table 2 are found in Table 2, but the result  
11 for the COMMIT variable is not shown in Table 2, and  
12 that's why I did the replication, to show what it was.

13 MR. MINTON: Why do you suppose --

14 BY MR. FORESTA:

15 Q Do you agree with me --

16 MR. MINTON: Why do you suppose the authors of  
17 that study would -- well, never mind.

18 BY MR. FORESTA:

19 Q Dr. Wecker --

20 A Yes.

21 Q -- you would agree with me that there is no  
22 data published in this report, no numbers in this report  
23 on Table 2, or anywhere else, that show the results of  
24 the regression analysis run on COMMIT intervention

1 status as a predictor of quit?

2 A Yes, the table --

3 Q Show me where that is.

4 A Table 2. But what's not on Table 2 is one of  
5 the variables named COMMIT, but the regression analysis  
6 using COMMIT is the regression that's reported in Table  
7 2; it's just that Table 2 doesn't report everything  
8 about it. And that's why I did a more complete printout  
9 and show you that on tab 70.

10 Q Recognizing that COMMIT interventions had an  
11 effect on quit rates, the authors of the 1997 study  
12 specifically adjusted for that effect before considering  
13 the other predictors, isn't that correct?

14 MR. MINTON: Object.

15 MR. BURTON: Object to the form.

16 MR. MINTON: It's unanimous.

17 THE WITNESS: The variables that they  
18 considered were the ones that are in Table 2, including  
19 the one at the bottom of Table 2.

20 BY MR. FORESTA:

21 Q Recognizing that COMMIT interventions had an  
22 effect on quit rates, the authors of the 1997 study  
23 specifically adjusted for that effect before considering  
24 the other predictors; isn't that correct?

1 MR. BURTON: Object to the form.

2 THE WITNESS: Let me parse it out. The premise  
3 is no good, but the part about -- the last part does  
4 describe that -- it's not a very careful description,  
5 but it is a description of what you see in Table 2,  
6 which is a bunch of variables that are involved in a  
7 regression analysis on the -- as to their involvement in  
8 the quit rates, including the COMMIT variable, which is  
9 mentioned at the bottom of the page.

10 BY MR. FORESTA:

11 Q Have you reviewed the "Methods" section of this  
12 report, Dr. Wecker?

13 A You're talking about --

14 MR. BURTON: Which report?

15 THE WITNESS: Which report?

16 BY MR. FORESTA:

17 Q Exhibit 3, the 1997 report.

18 A Article, you mean. I've read the whole  
19 article.

20 Q Okay. In the "Methods" section, where do the  
21 authors describe what you just said they did?

22 A Well, that whole "Methods" section is  
23 background or general description about what they did.  
24 They start talking about the data and where it came

1 from.

2 Actually, I think this "Methods" section is  
3 really more talking about the COMMIT -- the methods in  
4 the COMMIT study. But they go on about the details of  
5 the data collection and the COMMIT study communities  
6 and -- it says "Outcome measures." They reference back  
7 to the 1995 study as the earlier study.

8 Q And then it says to take account of the effect  
9 of COMMIT intervention, relationship between  
10 individual-level predictors of smoking cessation were  
11 adjusted for the effects of the COMMIT intervention,  
12 doesn't it?

13 A You didn't read it quite right, but I've read  
14 that, yeah.

15 Q I wasn't quoting it, I was just  
16 characterizing -- or paraphrasing what it was that the  
17 authors did.

18 A Well, you left --

19 Q I paraphrased it correctly, did I not?

20 A Well, how can a paraphrase be correct? You  
21 paraphrased it, and I know what you're talking about, so  
22 I'm quite ready to go on with the next question.

23 Q If you continue on that column, Dr. Wecker, the  
24 last full sentence on -- or the last sentence on that

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1 page starts with "Smoker characteristics evaluated in  
2 relation to smoking cessation included," and then they  
3 list of series of characteristics; correct?

4 A Yes.

5 Q The first of which is age and then gender and  
6 then it moves on to race/ethnicity. You see that?

7 A I do.

8 Q If you continue reading down the list, where do  
9 you see a reference to "participation in a COMMIT  
10 intervention"?

11 A It's not on that list, because it's not a  
12 smoker characteristic.

13 Q The smokers who were studied in the COMMIT  
14 study had various demographic characteristics; correct?

15 A Yes.

16 Q And those characteristics were all studied as  
17 potential predictors for quit rates in the 1997 study;  
18 isn't that correct?

19 A Well, I don't think it would be accurate to say  
20 all of them, but the ones that were studied were  
21 studied.

22 Q Okay. And before undertaking that analysis,  
23 Dr. Wecker, the authors of this study needed to account  
24 for the effect of COMMIT intervention on the 20,000-plus

1 people who were analyzed for purposes of this study;  
2 isn't that correct?

3 MR. MINTON: Objection. Asked and answered.

4 MR. BURTON: Object to the form.

5 THE WITNESS: No, I don't think you understand  
6 how they did it. They simply included the COMMIT  
7 variable along with all the others, and that's the  
8 sensible way to do it. I have no quarrel with that.

9 BY MR. FORESTA:

10 Q Would you say that participation in a COMMIT  
11 intervention program is not a smoker characteristic?

12 MR. BURTON: Object to the form.

13 THE WITNESS: Yes, I wouldn't think of that as  
14 a demographic characteristic. That's an aspect of the  
15 experiment. What I had in mind is the smoker  
16 characteristic is like whether they're male, how old  
17 they are, what their education is, that sort of thing.

18 BY MR. FORESTA:

19 Q And that's, in fact, what the authors of this  
20 study were investigating when they ran their regression  
21 analysis? Smoker characteristics; correct?

22 A Yes, they were looking at smoker  
23 characteristics.

24 Q And participation in the COMMIT intervention



1 program is not a smoker characteristic?

2 A That's right. That's why it wasn't on the  
3 earlier list, but it is one of the things they adjusted  
4 for.

5 Q Let's go back to your report, please.

6 A Okay.

7 Q The last sentence in the first paragraph says,  
8 "The result of Dr. Cummings's more refined analysis of  
9 the COMMIT data shows that the COMMIT intervention  
10 program had a statistically insignificant effect on the  
11 quit rate." Did I read that correctly?

12 A Yes.

13 Q That conclusion does not appear anywhere in the  
14 1997 article which we've marked as Exhibit 3 to your  
15 deposition, does it?

16 A No, I didn't put my opinion in the article. I  
17 put my opinion in my report.

18 Q I just want to make sure that this is your  
19 opinion, not the opinion of the authors of the 1997  
20 reports. It is not their opinion, is it, Dr. Wecker?

21 A Well, I don't know what all their opinions  
22 might be, but I didn't intend to be stating their  
23 opinions. I was stating my opinions based on my  
24 analysis.

Wecker

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1 Q Anywhere in the 1997 report, Dr. Wecker, does  
2 it state that the COMMIT intervention program had a  
3 statistically insignificant effect on the smoking quit  
4 rate?

5 A No, I don't believe they got around to pointing  
6 that out.

7 MR. FORESTA: I'll move to strike the  
8 nonresponsive portion of that answer.

9 Q I know it's getting late, Dr. Wecker, but if  
10 you could just answer my question, I'd appreciate it.

11 MR. MINTON: I think it was an answer.

12 BY MR. FORESTA:

13 Q Can you take a look at the second paragraph on  
14 page 2, Dr. Wecker, under your -- under heading Roman  
15 numeral I. Read that to yourself, please.

16 A The whole paragraph?

17 Q Yes, please.

18 A Okay, just a second. Okay.

19 Q The second -- excuse me, the third sentence  
20 states, "I analyzed the male members of the COMMIT  
21 population using the same methods that Dr. Cummings used  
22 in his 1995 paper." Do you see that?

23 A I think you misspoke.

24 Q I'll try it again. "I analyzed the male

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1 members of the COMMIT population using the same methods  
2 that Dr. Cummings used in his 1995 paper." Did I get  
3 that right?

4 A I think you got it wrong again. It says '97.

5 MR. BURTON: You-all are reading different  
6 sentences.

7 THE WITNESS: Oh.

8 BY MR. FORESTA:

9 Q Third sentence, sir.

10 A I must be looking at the wrong spot, so help me  
11 out again.

12 Q All right. We're all getting a little punchy.  
13 Second

14 MR. MINTON: There's one that's just like that  
15 above it, but it does read 1995. If you'll look down,  
16 there's another one that says 1997.

17 BY MR. FORESTA:

18 Q Just looking at the third sentence of the  
19 second paragraph.

20 A Okay, I'm with you now.

21 Q "I analyzed the male members of the COMMIT  
22 population using the same methods that Dr. Cummings used  
23 in his 1995 paper."

24 A Okay.

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1 Q Did I read that correctly?

2 A I'm with you.

3 Q All right. How did you undertake that  
4 analysis? Tell me what methods you used.

5 A Okay, just a second. Okay, I'll give you an  
6 answer; you may want to follow up for more details. But  
7 what I did was the same methodology as the '95 paper, as  
8 I've indicated, with one change. And the one change was  
9 that -- let me read this again. I'm not sure what  
10 sentence you're referring to, but I think it's the one  
11 about the male population, and with respect to that  
12 calculation, I simply restricted the input data to be  
13 men only.

14 Q Yeah, but what I want to know is, what were the  
15 methods that you used in analyzing this segment of the  
16 COMMIT population? You used the same methods that  
17 Dr. Cummings used in his 1995 paper --

18 A Right.

19 Q -- correct?

20 I would like you to explain, if you can, what  
21 those methods are.

22 A Okay. Leaving aside, then, the aspect of the  
23 method that I thought you were inquiring about, which is  
24 the difference, having to do with men versus men and

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1 women, I'll set that one aside, and then all I'll have  
2 to explain to you is what Cummings can teach you, which  
3 is he how he calculates his 1.8 percent. Do you want me  
4 to go through how he does that?

5 Q The method that Dr. Cummings used to calculate  
6 the 1.8 percent is the same method that you used in  
7 coming up with your calculations for your analysis, the  
8 members of the COMMIT population, except for the fact  
9 that you restricted it solely to the male members of the  
10 COMMIT population; correct?

11 A Exactly. Exactly.

12 Q No other differences in the two methods?

13 A That's correct, it's the 1.8 percent method  
14 restricted to men only.

15 MR. MINTON: And we're talking specifically  
16 about this line of the report.

17 THE WITNESS: I've lost track of what line I'm  
18 talking about, but I'm trying to answer your questions.

19 BY MR. FORESTA:

20 Q Your analysis of the male members of the COMMIT  
21 study -- the COMMIT population?

22 A Yeah, the men-only calculation, right.

23 MR. MINTON: Well, as reflected in this  
24 sentence in the report.

1 THE WITNESS: Yeah, I've understood that as the  
2 context.

3 MR. MINTON: All right.

4 THE WITNESS: Judging by your repeated  
5 questioning, I figure I may be missing something in the  
6 question, but if I understood your question, I pointed  
7 to the right spot.

8 BY MR. FORESTA:

9 Q And how, if at all, Dr. Wecker, did you account  
10 for the missing data from the 1995 study?

11 MR. BURTON: Object to --

12 THE WITNESS: Well, the same way as Cummings,  
13 essentially it ignores the nonresponders.

14 BY MR. FORESTA:

15 Q It's your position that Dr. Cummings, in the  
16 '95 report, ignored the nonresponders?

17 A Yes.

18 Q What was the size of the sample that you  
19 studied when you looked at the members -- the male  
20 members of the COMMIT' population?

21 A Oh, I'd have to add it up. I've got city by  
22 city, but I don't have -- I don't have it all added up.  
23 You could look in tab 72 and get a calculator out and  
24 add 44 numbers and you could get it.

1 Q Do you have a ballpark estimate of what  
2 percentage of the total 20,000-plus members of the  
3 COMMIT study were male?

4 A It looks like about half.

5 Q So when you segregated out the men in analyzing  
6 the COMMIT data, you essentially took away one half of  
7 the population from the initial study; correct?

8 A Yes, the women.

9 Q And what was your basis for analyzing only the  
10 male members of the COMMIT population?

11 A I thought it would be -- have greater relevance  
12 to the issues in this case.

13 Q Why was that?

14 A Because the claimants in this case -- or  
15 discussed in this case are predominantly male.

16 Q In the 1995 study, Dr. Wecker, there was no  
17 statistically significant difference between men and  
18 women in the effect of the COMMIT intervention on their  
19 quit rates; isn't that correct?

20 A I would expect not, but I'd have to get the  
21 article out, see where you're referring to. But I  
22 would -- that's what I would expect.

23 Q You would expect what?

24 A That there would not be a difference, neither

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1 one had an effect.

2 Q That wasn't my question. If you take a look at  
3 page 189 --

4 A Okay, just a minute.

5 Q -- of the '95 study --

6 A One second. Okay.

7 Q If you look in the second column, about halfway  
8 down, there's a paragraph that starts with the words  
9 "The analyses."

10 A Yes.

11 Q The full sentence -- or actually the first  
12 portion of the sentence says, "The analyses here showed  
13 little difference between men and women in the effect of  
14 the COMMIT intervention." Do you dispute that finding?

15 A No, I'm not disputing that.

16 Q So if there was no difference between the  
17 effect on men and women, why is it that you thought it  
18 was necessary to exclude women from the population that  
19 you analyzed?

20 MR. MINTON: Object to the form of the  
21 question.

22 MR. UGARTE: Objection.

23 THE WITNESS: It didn't say "no difference."  
24 It said "showed little difference," and I've already



1 answered that I thought looking at the men made better  
2 sense in the context of this case because the claimants  
3 are predominantly male.

4 BY MR. FORESTA:

5 Q By looking only at the men, Dr. Wecker, you  
6 decreased the statistical power of the COMMIT study, did  
7 you not?

8 A Not as it applies to men.

9 Q How about as it applies to the entire  
10 population of people studied in the COMMIT study?

11 A I would -- I agree the sample size is smaller  
12 when you look at men as opposed to men plus women, and  
13 in that respect, I agree with you. But the sample size  
14 is still very large, and the study is quite capable of  
15 detecting effects, if there are any, even for just men.

16 MR. FORESTA: I'm sorry, I missed the last --  
17 the tail end of that response. Can you have that read  
18 back, please.

19 (Record read.)

20 BY MR. FORESTA:

21 Q Is it your opinion, Dr. Wecker, that gender is  
22 a confounder in evaluating the quit rates in the '95  
23 COMMIT study?

24 A It's at least a potential confounder. I'd have

1 to look at my other output to see how big a deal it is,  
2 but it's one of the things you'd want to think about for  
3 sure, and --

4 Q Did you --

5 A Let me finish up.

6 Q Sir, I'm sorry.

7 A And certainly the '97 article recognizes that  
8 it's one of the variables you'd want to take into  
9 account, and the COMMIT study itself, the very fact that  
10 they record that information reflects that it's a  
11 variable that would be of interest.

12 Q But the very fact that they recorded it does  
13 not establish that it's a confounder, does it?

14 A That's right. It's a covariate that would be  
15 an obvious one to consider. I've now turned to a  
16 resource here, and it looks like it is a significant  
17 covariate based on the analysis here.

18 Q What are you talk- -- what are you referring to  
19 now?

20 A I'm looking on Table 2 from the '97 article to  
21 notice a difference in the effects of men -- between men  
22 and women.

23 Q Is there anything in the 1995 study that says  
24 that gender is a confounder in evaluating quit rates

1 among members of the intervention cohort versus the  
2 comparison cohort?

3 MR. MINTON: Take your time, look at --

4 BY MR. FORESTA:

5 Q I'm focusing strictly on the '95 report.

6 MR. MINTON: Go ahead and look.

7 THE WITNESS: Oh, '95 only. I'm sorry, I  
8 didn't hear that. Well, I'll have to go through that  
9 report again. Just a minute. You really want me to  
10 take the time to do that? I mean, it's either in here  
11 or it isn't, but if you want me to go through it, I'm  
12 going to take another ten minutes to go through the  
13 whole thing again.

14 BY MR. FORESTA:

15 Q Do you know, can you point to me a section  
16 here, without reviewing it, do you know whether in the  
17 1995 study there is evidence that gender is a confounder  
18 in evaluating quit rates?

19 A I don't think in '95, because they didn't study  
20 that until '97. But there's certainly an indication  
21 that they're aware it is a covariate, and they mention  
22 it on Table 2 of the '95 article.

23 Q Let's move on to the next paragraph on page 2  
24 of your report, Dr. Cummings (sic), where you discuss

1 your analysis of blue-collar male members of the COMMIT  
2 population. Do you see that?

3 A The next paragraph?

4 Q Yes.

5 A Just a minute.

6 Q It starts on the bottom of page 2 and then  
7 carries over.

8 A Okay, I'm with you.

9 Q All right. What was the sample size of  
10 blue-collar male members that you studied?

11 A Well, I'll see -- I think I can get you that.  
12 Just a minute.

13 Well, I can refer you to the analysis, but the  
14 numbers are printed out separately for every city, so  
15 I'd have -- and again, separately by heavy versus light  
16 to moderate, so I'd have to add 44 numbers to get that  
17 for you.

18 Q Do you have any reason to disagree with me,  
19 Dr. Wecker, that male blue-collar workers comprise only  
20 25 percent of the total population studied than the '95  
21 analysis.

22 A That looks about right.

23 Q And when you studied or when you analyzed only  
24 25 percent of the COMMIT population, when you looked at

1 the blue-collar male members, you decreased the  
2 statistical power of the COMMIT study, did you not?

3 A The first part of the question again, please.

4 When I did what?

5 Q When you analyzed or studied the blue-collar  
6 male population of the COMMIT study --

7 A Okay, I got you. Not -- no, not with respect  
8 to conclusions to be reached about blue-collar men only.

9 That's --

10 Q What about with respect to conclusions to be  
11 drawn about the population as a whole and the effect of  
12 COMMIT interventions on quit rates?

13 A Ah, for that you wouldn't look at blue-collar  
14 men only, I agree; you'd look at the population as a  
15 whole.

16 Q But in looking at only 25 percent of the  
17 population and then determining whether there was a  
18 statistically significant correlation between a COMMIT  
19 intervention in quit rates -- strike the question. Way  
20 too late to be asking that kind of question.

21 Dr. Wecker, do you agree that 25 percent of the  
22 population studied in the COMMIT study was classified as  
23 retired?

24 A I don't have that number in my head, so I can't

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1 tell you that.

2 Q Do you have any idea of what population or what  
3 percentage of the COMMIT population study was classified  
4 as retired?

5 A No, I just don't have that number in my head,  
6 I'd have to look at the underlying data.

7 Q The COMMIT study did not track prior work  
8 status for retired people, did it?

9 A I don't think so, but I'm just not able to  
10 recall that detail, so I can't answer that with  
11 assurance.

12 Q Did you undertake any analysis to try to  
13 determine what percentage of the people classified as  
14 retired were former blue-collar workers?

15 A I don't think so, no, nothing is coming to  
16 mind.

17 Q Are you aware that in the retired population,  
18 education level was overweighted towards high school  
19 education or less?

20 MR. MINTON: Object to the form of the  
21 question. Are you talking about a classification that  
22 lies within occupation group?

23 MR. FORESTA: Blue-collar workers as Dr. Wecker  
24 has analyzed.

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1 MR. MINTON: No, I'm -- I'm confused.

2 MR. BURTON: Object to the form.

3 MR. MINTON: Object to the form. I'm confused  
4 by the question. Are you suggesting that retired was an  
5 occupation group --

6 MR. FORESTA: No.

7 MR. MINTON: -- variable?

8 MR. FORESTA: No, no. What I want to know is  
9 whether Dr. Wecker did any analysis of the retired  
10 people to find out what their prior work status was.

11 THE WITNESS: No, I don't believe I did.

12 BY MR. FORESTA:

13 Q My next question -- I'm not sure whether I got  
14 an answer to this, Dr. Wecker, or not, and I apologize  
15 if you did answer it, but are you aware that in the  
16 retired population, where the segment of the COMMIT  
17 study classified as retired, the education level was  
18 overweighted towards high school education or less?

19 MR. BURTON: Object to the form.

20 THE WITNESS: Yeah, I don't know what you mean  
21 by "overweighted."

22 BY MR. FORESTA:

23 Q In proportion to the education level for the  
24 COMMIT study as a whole, do you have any idea what the

1 education level was for those who were classified as  
2 retired?

3 A No, I didn't study that group separately.

4 Q Can we flip to page 3 of your report, please.

5 A Yes.

6 Q The first full paragraph that's on that page.

7 A Okay.

8 Q Can you read that to yourself, please.

9 A Okay. Okay.

10 Q Is it your opinion, Dr. Wecker, that there was  
11 a statistically significant difference in the baseline  
12 quit rates between the intervention communities and the  
13 comparison communities?

14 A No, I'm not expressing that opinion.

15 Q And, in fact, there was no statistically  
16 significant difference between those baseline quit  
17 rates, isn't that correct?

18 A I'm not sure I investigated that, so I can't  
19 tell you that as a fact.

20 Q Well, you took into account what you believed  
21 to be a difference in the baseline quit rates in doing  
22 your analysis, didn't you?

23 A Yes, I did that.

24 Q And you did that without analyzing whether that

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1 difference was statistically significant?

2 A That's right, because that's the way to do it.

3 Q The second full sentence of this paragraph  
4 says, "I found that the intervention communities had  
5 higher smoking quit rates in the control communities  
6 even before the COMMIT intervention." Where did you  
7 find that, Dr. Wecker?

8 A Just a moment, I'll get you that. I've got a  
9 phone ringing here. Turn that thing off.

10 In the Monograph 6.

11 Q Do you have Monograph 6 in front of you?

12 A Yes.

13 Q Do you know where in Monograph 6 that  
14 information came from?

15 A Yes.

16 Q Can you turn to it, please.

17 A Sure. Page 31.

18 Q And that's in Chapter 3 of the monograph?

19 A Yes.

20 Q Table 3 is not -- or does not reflect a survey  
21 of COMMIT participants, does it, Dr. Wecker?

22 A Depends on what stage of the participating you  
23 have in mind. So perhaps you could clarify.

24 Q At any stage of the COMMIT study.

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1 A Yes, I think it does. In the early stages,  
2 they were out identifying households, and this is where  
3 they were picking up this information. This information  
4 was gathered as part of the COMMIT undertaking.

5 Q Okay. And that's what you referred to as the  
6 rostering process?

7 A Well, that's a term that the COMMIT people have  
8 used and I've just picked it up. I don't think they've  
9 defined it so precisely that I could define it for you,  
10 but it certainly means the early stage of the COMMIT  
11 work as opposed to the four-year follow-up part.

12 Q And no ex-smokers were included in the COMMIT  
13 study to determine the effect of an intervention program  
14 on quit rates; isn't that correct?

15 MR. MINTON: Object to the form of the  
16 question.

17 THE WITNESS: I don't understand that question.

18 BY MR. FORESTA:

19 Q Well, why would you include an ex-smoker in the  
20 COMMIT study when your goal is to assess the effect of  
21 an intervention program on quit rates?

22 MR. MINTON: Ask the people who designed the  
23 evaluation cohort and put them in there.

24 MR. FORESTA: Can you not provide gratuitous

1 answers like that, Mike?

2 MR. MINTON: It's a little frustrating to  
3 mis- -- when you misrepresent what's going on.

4 MR. FORESTA: I'm not misrepresenting anything.  
5 I'm asking him a question.

6 MR. MINTON: Well, yeah you are. There are at  
7 least 50 or a hundred ex-smokers in the COMMIT cohort.  
8 You know it, I know it, everybody in the room knows it.

9 MR. FORESTA: I asked Dr. Wecker that, and I  
10 didn't get an answer from him.

11 Can you please reask the last pending question.

12 (Record read.)

13 BY MR. FORESTA:

14 Q Can you answer that question, Dr. Wecker?

15 MR. BURTON: Object to the form.

16 THE WITNESS: I didn't do that. If you want to  
17 ask people's motivations who did that, you'd have to  
18 talk to somebody other than me.

19 BY MR. FORESTA:

20 Q You don't have an answer to my question, do  
21 you?

22 A I just gave you my answer, which basically says  
23 I'm not the right guy to be answering the question.

24 Q The answer to my question is no, you don't have

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1 an answer?

2 MR. MINTON: Object to the form.

3 THE WITNESS: I don't think you're being fair  
4 there. I tried to give you the best answer I had.

5 BY MR. FORESTA:

6 Q Is it your opinion, Dr. Wecker, that the  
7 communities in the COMMIT study were not well matched?

8 A Oh, I think that's a -- it's my opinion they  
9 could never be perfectly matched, that's for sure,  
10 but --

11 Q Makes the effort to match. Well matched.

12 A Well, I'm trying to struggle with this concept  
13 of well matched. It's easy on the extremes that they're  
14 certainly not perfectly matched, and because of that,  
15 you have to worry about differences between the cities,  
16 there's no question of that, but the study authors made  
17 some effort to make the cities comparable, so, for  
18 example, they didn't match Vallejo with New York.

19 Q Are you aware, Dr. Wecker, of the role that the  
20 National Cancer Institute played in the COMMIT study?

21 A No, not -- I'm not aware of the specific role  
22 they played.

23 Q Turning back again to your expert report,  
24 Dr. Wecker, Exhibit No. 1, in that same paragraph we

1 were on, on page 3.

2 A Okay.

3 Q You state that "When I refined the 1995  
4 analysis by controlling for the quit rate differences  
5 between the intervention and control communities prior  
6 to the intervention, I found that there was no  
7 significant intervention effect." Did I state that  
8 correctly?

9 A Yes.

10 Q How was it that you went about controlling for  
11 the quit rate differences between the intervention and  
12 control communities?

13 A By looking at the change in quit rates or  
14 change in differential quit rates in city pairs in the  
15 intervention period compared to the preintervention  
16 period.

17 Q Where did you find that information?

18 A The preintervention period was in Monograph 6.

19 Q And the intervention period came from the  
20 COMMIT data; is that correct?

21 A Right.

22 Q And then what did you do to come up with your  
23 control? Did you simply subtract the preintervention  
24 numbers from the numbers that were found in the

1 intervention period?

2 A Right.

3 Q Did you do anything else?

4 A No.

5 Q Why is it that you took into account the  
6 preintervention quit rates when you did your analysis of  
7 the intervention period quit rates?

8 A Because the effect of an intervention would  
9 have to be the incremental effect from what the status  
10 was before the intervention, and so I looked at what the  
11 status was before the intervention.

12 Q In order to do that, would the population of  
13 people who were in the -- who were involved in the  
14 preintervention period have to be the same as those who  
15 were studied during the intervention period?

16 A No.

17 Q It wouldn't matter if the population of people  
18 who quit smoking prior to the intervention were all  
19 women, for instance?

20 MR. BURTON: Object to the form.

21 THE WITNESS: I'm not following the question.

22 I'm sorry.

23 BY MR. FORESTA:

24 Q Do you know anything about the population of

1 people who were surveyed in the preintervention period  
2 in the COMMIT study, Dr. Wecker?

3 MR. UGARTE: Object to the form.

4 THE WITNESS: We know what the Monograph 6  
5 tells us about it. They're the same cities that the  
6 COMMIT research group continued to study with their work  
7 that continued into the 1990s.

8 BY MR. FORESTA:

9 Q And what else do we know about them other than  
10 what city they lived in?

11 A Well, I can see what else the monograph has to  
12 say about that. Just a minute. Well, there's a table  
13 with sociodemographic characteristics of the communities  
14 on page 29. And there's the description of the random  
15 sampling approach for the contacts and the various  
16 sample determinations that the COMMIT people made.  
17 That's --

18 Q Where does that appear? I'm sorry, where does  
19 that appear?

20 A I was looking at the bottom of page 30 where it  
21 says "to identify residents to be tracked." Your  
22 question says what do we know about the residents, but  
23 what we know about the residents in part comes from the  
24 samples that we take from them and study, so I thought

1 I'd mention that.

2 Q What do we know about the people who quit  
3 smoking in the COMMIT communities prior to the COMMIT  
4 interventions?

5 A Well, I can't give you any details on that as I  
6 sit here. I can tell you quit rates by city, because  
7 that's sitting here in Monograph 6.

8 Q Right.

9 A And it's possible, but I don't know, that there  
10 might be some other details to be found in the large  
11 databases that we have on CD, but nothing else comes to  
12 mind on that. I can go look at that tomorrow, perhaps.

13 Q Next paragraph on page 3, Dr. Wecker.

14 A Just a moment.

15 Q Can you read that to yourself, please. Again,  
16 this is referring to your Exhibit No. 1, the expert  
17 report.

18 A Okay, I've read that.

19 Q Is it your opinion, Dr. Wecker, that efforts to  
20 increase taxes as part of the COMMIT study had an effect  
21 on the quit rates that were observed?

22 A They would, I would expect, where they were  
23 large and successful, but just by first principles, but  
24 since the quit rates that we observe are essentially the



1 same in the intervention and nonintervention  
2 communities, it looked like, when you sum it all up,  
3 that must not have had an effect.

4 MR. FORESTA: Can you read that answer back  
5 again. I'm losing my train of thought.

6 THE WITNESS: So am I.

7 (Record read.)

8 BY MR. FORESTA:

9 Q Just so I understand it, it is your opinion  
10 that efforts to increase taxes as part of the COMMIT  
11 program did not have an effect on the quit rates  
12 observed?

13 MR. BURTON: Object to the form.

14 MR. UGARTE: Object to the form.

15 THE WITNESS: That's what I said. I was simply  
16 referring to the point we've been discussing for some  
17 time, that the intervention communities and the control  
18 communities appear to be essentially the same in terms  
19 of quitting, so you can't parse out the effect of the  
20 intervention, because it's composed of so many different  
21 parts that it can't be separated. But if I can use the  
22 final result as an indication, I would suppose that  
23 there were no large, successful tax changes that were  
24 actually implemented, at least they must not have been

1 large enough to have an effect, because I don't see an  
2 effect.

3 BY MR. FORESTA:

4 Q What efforts to increase taxes as part of the  
5 COMMIT program are you aware of?

6 A I didn't study any of that in detail. I did  
7 look through the list of things that were described. I  
8 don't have my materials here that were disclosed. I'll  
9 call it the Cummings disclosure materials, but they go  
10 on in a little more detail about the various aspects of  
11 the various pieces of the intervention. So all that  
12 meant -- all that said, I didn't have much detail for  
13 you on that.

14 Q Is it your belief that the Cummings materials  
15 contain information about efforts to increase taxes in  
16 the COMMIT communities?

17 MR. UGARTE: Object. We should clarify what  
18 we're talking about "the Cummings materials"?

19 MR. FORESTA: That was a phrase that the  
20 witness used.

21 MR. UGARTE: And I think we should clarify it  
22 in our asking another question.

23 MR. FORESTA: I don't know what the Cummings  
24 materials are.

1 MR. UGARTE: That's the point.

2 MR. FORESTA: He's referred to it --

3 Q Dr. Wecker, you know what the Cummings  
4 materials are, don't you?

5 A Yes, I meant all the materials that came to me  
6 in the context of my work that you're asking me about.  
7 It was a pile of about 8 inches of stuff.

8 Q And is it your belief that those materials  
9 contain information about efforts to increase taxes in  
10 the COMMIT communities?

11 A Well, I thought that was true. And I'm trying  
12 to think at this late hour where I can look in the  
13 materials I have here where they list all the different  
14 things they try to do. Let me just look here.

15 MR. MJINTON: You do cite four pages here from  
16 Monograph 6 as well.

17 THE WITNESS: Okay. Here's a spot. It's page  
18 42 of the Monograph 6. I reference page 41 in my  
19 footnote on the place we were just reading, and I see  
20 that the sentence carries over. It says "Factors that  
21 can influence smoking rates include cigarette taxes,"  
22 and it names some other things.

23 BY MR. FORESTA:

24 Q I'm sorry, I didn't have the monograph in front

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1 of me when you started giving your answer.

2 A Okay.

3 Q You're talking about the bottom of page 42?

4 A 41. The last line on page 41 that begins  
5 "Factors that" -- this is all in the context of a bunch  
6 of different intervention methods, and it --

7 Q Okay.

8 A -- says "factors that," and you turn the page,  
9 "can influence smoking rates include," and one of them  
10 that are mentioned here is cigarette taxes. I suspect  
11 there are other places if I -- if you want to give me  
12 the time, I'll look for other places like -- that  
13 mention cigarette taxes.

14 Q What you just read, though, Dr. Wecker, is not  
15 evidence that there were any increases in taxes as a  
16 result of the COMMIT study; correct?

17 MR. BURTON: Object to the form.

18 MR. UGARTE: Objection.

19 THE WITNESS: That's correct.

20 BY MR. FORESTA:

21 Q What evidence do you have that there were any  
22 increases in taxes resulting from the COMMIT study or as  
23 part of the COMMIT study?

24 A I didn't -- it may be getting late here, but I

1 don't remember saying that. My report talks about  
2 efforts.

3 Q Um-hmm, I understand.

4 A It doesn't --

5 Q And what I'd like to know now is, are you aware  
6 of any evidence that taxes were increased as a result of  
7 the COMMIT program?

8 A Not off the top of my head here. It may be  
9 that in the materials I didn't bring, there's -- because  
10 I do recall some -- there was some further details  
11 there, but actually implementing tax increases, I can't  
12 point you to a spot. But I did answer earlier that it  
13 doesn't look like there could have been any big tax  
14 increases implemented, because I just don't see any  
15 effect. And I would expect large tax increases would  
16 have an effect, and since I don't see an effect, maybe  
17 that there weren't any.

18 Q What's the basis for your opinion that large  
19 tax increases would have an effect on quit rates?

20 A Just the demand curve sloped downward.

21 Q You make reference to the COMMIT intervention  
22 involving constraints on advertising and promotion of  
23 tobacco products in that paragraph. Do you see that?

24 A Yes.

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1 Q What evidence do you have of constraints on  
2 advertising and promotion of tobacco products as part of  
3 the COMMIT intervention study?

4 A Again, if you read the full sentence, it talks  
5 about effects of efforts to do these things, and the  
6 Monograph 6 in the areas -- the pages that I've cited in  
7 the footnote 10, and have been discussing with you just  
8 now -- and let me see if there's some pages, other pages  
9 here. Just a minute.

10 Okay, let me get my head straight here.  
11 We're -- I'm looking around here for constraints on  
12 advertising and promotion; is that right?

13 Q Yes, sir.

14 A Okay. And I would refer you to Monograph 6,  
15 and here I'm finding a vending machine ordinance  
16 proposal, that looks like it's essentially on target.

17 Q Where do you see that reference?

18 A That's on page 104. I'm just -- there's a  
19 section here that's very long on this topic, and I'm  
20 just trying to skim it.

21 Also at the bottom of page 104 it says an  
22 ordinance was ratified, so it's more than just an  
23 effort. Some on page 100 about Raleigh, North Carolina.  
24 This section is so long that I'm trying to avoid reading

1 it word for word, but the -- it begins "Changing public  
2 policy around tobacco control in COMMIT communities,"  
3 and it goes on at length.

4 Q And what evidence do you have of the impact of  
5 these constraints on advertising and promotion of  
6 tobacco products on quit rates as they were studied in  
7 the COMMIT study?

8 A Oh, the evidence is the results. They  
9 apparently had no effect.

10 Q It's your opinion that efforts to constrain  
11 advertising and promotion of tobacco products had no  
12 effect on the quit rates that were evaluated in the  
13 COMMIT study; is that correct?

14 MR. BURTON: Object to the form.

15 THE WITNESS: If I understand the question, the  
16 answer is yes, that's the essential result of the COMMIT  
17 study, that they weren't finding effects on quit rates,  
18 at least -- leave aside the assertion that the 1.8  
19 percent was marginally significant. I disagree with  
20 that. But my finding is and the essence of the COMMIT  
21 study, I think, is that they find either zero or a  
22 negligible effect on quit rates.

23 BY MR. FORESTA:

24 Q And the same holds true for restrictions on

1 smoking in public places?

2 MR. BURTON: Objection. Are you talking --

3 THE WITNESS: The same holds true for the  
4 composite of all the different aspects of the  
5 intervention. I think they -- I've forgotten the  
6 number, but number 58 strikes -- sticks in my mind.  
7 There were a large number of different undertakings, and  
8 the intervention is the sum total of all those, and it's  
9 the effect on quit rates, and I don't see effects on  
10 quit rates.

11 BY MR. FORESTA:

12 Q Okay. So whether you look at it as a whole, or  
13 whether you look at each one of these components  
14 individually, none of it, in your opinion, had an effect  
15 on quit rates as they were studied in the COMMIT study;  
16 correct?

17 A No, not correct. My point is you can't look at  
18 it individually; you can only look at it as a composite.

19 Q But you have no evidence that any one of those  
20 components of the COMMIT intervention had any impact on  
21 quit rates that were observed in the COMMIT study --

22 MR. MINTON: Objection --

23 BY MR. FORESTA:

24 Q -- correct?

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1 MR. MINTON: -- asked and answered.

2 THE WITNESS: That's a double answer. No  
3 effect for the composite, and therefore, no effect for  
4 any portion, because you'd expect to see that in the  
5 composite.

6 BY MR. FORESTA:

7 Q Thank you.

8 A Are we finished?

9 MR. FORESTA: Why don't we take about a five-  
10 to ten-minute break, just so I don't completely derail  
11 the train, and then we'll finish up.

12 MR. BURTON: Steve, at this point, we've been  
13 going almost six hours on a short report, and we're  
14 going to cut this off in about --

15 MR. FORESTA: Fairly quick.

16 MR. BURTON: I'm just going to tell you, we're  
17 going to cut it off in about 30 minutes, if you --

18 THE WITNESS: Yeah, I'd be glad to keep going  
19 if you want. I don't need a break.

20 MR. FORESTA: No, I do. We're taking a break  
21 for me.

22 THE WITNESS: Okay.

23 MR. FORESTA: You don't have to take one.

24 THE VIDEOGRAPHER: The time is 8:12, and we're

1 going off the videotaped record.

2 (Recess.)

3 THE VIDEOGRAPHER: The time is 8:21. We are  
4 back on the videotaped record.

5 BY MR. FORESTA:

6 Q All right, welcome back, Dr. Wecker. We're in  
7 the home stretch.

8 A Okay.

9 Q Is it your opinion, Dr. Wecker, that the COMMIT  
10 study has generated data and conclusions that are  
11 externally valid to the population of the Manville Trust  
12 claimants?

13 A I take it that you mean by that, that the  
14 conclusions from the COMMIT study could be useful in  
15 applying to the Manville Trust claimants, and I --

16 Q Well, let me just interrupt there. You're  
17 familiar with the concept of external validity, are you  
18 not?

19 A Yes, but I didn't want to use a buzz word here  
20 when ordinary English would serve. And so I'll -- so I  
21 understand your question. I'm not having trouble  
22 understanding you. And the answer is that I think that  
23 the COMMIT data is a useful body of data from which one  
24 can make instructive statements about the Manville Trust

1 data, the claimant data -- perhaps I should just say the  
2 claimants -- especially if you restrict attention to  
3 make the two groups even more comparable by looking at  
4 the blue-collar males from the COMMIT data.

5 Q And what is the basis for that belief,  
6 Dr. Wecker?

7 A Well, one thing is that the COMMIT study is a  
8 randomized experiment, so I like the design of it, And  
9 the other is that if you restrict attention to people  
10 that are more similar to the claimants, you can't help  
11 but improve the comparison.

12 Q How many asbestos-exposed workers were studied  
13 in the COMMIT study?

14 A I can't tell you that.

15 Q That information is not available, is it?

16 A I'm thinking. I have a vague recollection  
17 there was something more detailed about the occupations  
18 there than just blue-collar status, but I'm afraid it's  
19 getting late, and I can't remember exactly what I'm  
20 trying to remember. In any event, I can't tell you what  
21 percent as I sit here.

22 Q You can't tell me what percentage of the COMMIT  
23 study participants were asbestos-exposed workers;  
24 correct?

1           A   That's right, I'm remembering better now.  
2           There was -- somewhere in these documents there was a  
3           list of what the different occupations were that are  
4           subsumed under the category of blue collar, but I've  
5           forgotten where I saw that.

6           Q   In your report again -- before we get back to  
7           your report, let me just ask you, have you ever reviewed  
8           any of the trust claimant files?

9           A   I thought I was going to hear somebody object  
10          to that.

11          MR. MINTON: You mean in connection with the  
12          supplemental report?

13          MR. FORESTA: Yes.

14          THE WITNESS: Not in connection with the  
15          supplemental report.

16          BY MR. FORESTA:

17          Q   In connection with the opinions that you've  
18          formulated that are set forth in your supplemental  
19          report.

20          A   No, not in any respect in connection with the  
21          work I did that is the subject of this deposition.

22          Q   But you have done it in the past for other  
23          purposes?

24          MR. MINTON: I object to the question. We're

1 not going into other work.

2 MR. FORESTA: We're not going into other work?

3 MR. MINTON: Yeah. We're talking about the  
4 work he did and the opinions he formulated in the  
5 supplemental report.

6 BY MR. FORESTA:

7 Q It's your opinion that the information, the  
8 data that was collected in the COMMIT study, is useful  
9 as applied to the Manville Trust claimants, is it not?

10 A Yes.

11 Q And what do you mean by "useful"?

12 A It's informative as to the effect or lack  
13 thereof of intervention or information programs on  
14 quitting.

15 Q Even though through your analysis of the COMMIT  
16 data you found no statistically significant effects of  
17 the COMMIT intervention on quit rates?

18 A That's true.

19 Q Now we'll turn to Exhibit No. 1, which is your  
20 expert report, and in particular, the last page, page 4,  
21 in your opinions under heading Roman numeral number II.

22 A Okay.

23 Q Can you read over the first paragraph,  
24 please --

1 A Okay.

2 Q -- to yourself.

3 Have you done that, sir?

4 A Not quite.

5 Q Okay. Please let me know when you have.

6 A Okay.

7 Q I want to focus in particular on the second  
8 sentence of Roman numeral number II where you state,  
9 "Dr. Harris's claim of a greatly increased quit rate is  
10 contradicted by Dr. Cummings's 1995 and 1997 analyses,  
11 and by my analyses in section I." Did I read that  
12 correctly?

13 A Yes.

14 Q What I would like to ask you, Dr. Wecker, is in  
15 what way is Dr. Harris's claim of a greatly increased  
16 quit rate contradicted by Dr. Cummings' 1995 analysis?

17 A Dr. Cummings' 1995 analysis finds no greatly  
18 increased quit rate.

19 Q And that is based on your belief that an  
20 increased quit rate of 1.8 percent is not a greatly  
21 increased quit rate; correct?

22 MR. MINTON: Object to the form.

23 THE WITNESS: I wouldn't have to limit it to  
24 that, but even that by itself, I would agree is a

1 contradiction as described in the sentence.

2 BY MR. FORESTA:

3 Q And Dr. Cummings' conclusion that there is a  
4 1.8 percent increase in quit rates is based on an  
5 analysis of the entire COMMIT population; correct?

6 A Well, it's based on the group that they  
7 followed for the four years. The population varied in  
8 different stages and aspects of their work.

9 MR. MINTON: Let me belatedly assert an  
10 objection to form.

11 BY MR. FORESTA:

12 Q But Dr. Cummings, in his 1995 analysis, did not  
13 do a particularized analysis of male workers or male  
14 participants, did he?

15 A That's right. I did that.

16 Q And he didn't do a particularized analysis of  
17 blue-collar workers in the '95 analysis, did he?

18 A Right.

19 Q The analysis that you did is you applied  
20 Dr. Harris's quit rate model to the data for men from  
21 COMMIT; correct?

22 A That's -- we've changed subjects, but yes, I  
23 did that too.

24 Q And you did that, too, in addition to what?

1 A Well, you pointed to a sentence that you wanted  
2 to talk about, but now you're talking about another  
3 sentence. It has nothing to do with the sentence we  
4 were -- that you were asking me about.

5 Q Well, let me just ask you --

6 A I don't mind. It was just an abrupt  
7 transition. I can follow you.

8 Q You did an analysis, Dr. Wecker -- you  
9 conducted an analysis where you applied Dr. Harris's  
10 quit rate model to the data for men from the COMMIT  
11 rate; correct?

12 A That's true.

13 Q What data for the men did you use?

14 A The men who were a part of the four-year  
15 follow-up cohort.

16 Q You did not do an analysis where you applied  
17 Dr. Harris's quit rate model to the data for blue-collar  
18 males, did you, Dr. Wecker?

19 A Well, let me look. Just a minute. The answer  
20 is yes, in the following sense: That the analysis that  
21 I cite in the footnote 14, if you were to go look at it,  
22 you will see that one aspect of it is that I did include  
23 occupation variables, one of which is a blue-color  
24 variable.



1 Q Let me just ask this question, Dr. Wecker: Did  
2 you apply Dr. Harris's quit rate model to the data for  
3 blue-collar men from the COMMIT study?

4 A Yes --

5 MR. UGARTE: Objection.

6 THE WITNESS: -- I did in the sense that I just  
7 described.

8 BY MR. FORESTA:

9 Q Yes, you did?

10 MR. UGARTE: Object to the form.

11 MR. BURTON: Object to the form.

12 MR. MINTON: Boy, I feel real peer pressure  
13 there.

14 THE WITNESS: Go ahead.

15 BY MR. FORESTA:

16 Q What were the results of that analysis?

17 A Just a minute. It shows no significant quit  
18 rates and no significant effects of blue collar.

19 Q No significant quit rate --

20 I'm sorry, can you read the answer back,  
21 please.

22 (Record read.)

23 BY MR. FORESTA:

24 Q What was the quit rate that you found when you

1 applied Dr. Harris's quit rate model to the data for  
2 blue-collar men from the COMMIT study?

3 A The quit rate part is 1 -- is an odds ratio of  
4 1.018. Not statistically significant.

5 Q Where do you find that -- or where would I find  
6 that? -- better.

7 A Tab 65.

8 Q 65?

9 A har3s\_commit.log.

10 Q Can you just say that again, a little slower,  
11 please.

12 A Sure.

13 Q har?

14 A har3s\_commit.log.

15 Q All right. Thank you.

16 The last sentence of that paragraph,  
17 Dr. Wecker, says, "I found that Dr. Harris's model  
18 estimates a statistically insignificant quit rate of  
19 only 1.04 times higher for the group educated about  
20 smoking.

21 A Yes.

22 Q You did not do an analysis of the effect on a  
23 group educated about smoking tobacco synergy, did you?

24 MR. UGARTE: I'm sorry, could you read that

1 back, please.

2 (Record read.)

3 THE WITNESS: Well, no, this is the COMMIT  
4 intervention group.

5 BY MR. FORESTA:

6 Q Right. And the COMMIT intervention group was  
7 not warned about smoking tobacco synergy?

8 MR. MINTON: Object to the form of the  
9 question.

10 MR. UGARTE: Object to the form.

11 THE WITNESS: I'm not sure what the full  
12 spectrum was of their contacts on that subject.

13 BY MR. FORESTA:

14 Q Okay. As you sit there, though, Dr. Wecker,  
15 can you tell me that the participants in the COMMIT  
16 intervention study were warned about asbestos tobacco  
17 synergy?

18 A No, I'm not sure. They had a multitude of  
19 different aspects to the intervention, but I can't tell  
20 you what they all are, and whether that was one of the  
21 things that was included or not.

22 Q Dr. Harris's intervention model assumes a  
23 different type of intervention than you had in the  
24 COMMIT study; isn't that correct?

1 MR. UGARTE: Objection. Scope.

2 THE WITNESS: No, no, there's nothing about the  
3 model that does anything other than compare two groups.

4 BY MR. FORESTA:

5 Q Nothing about what model? The COMMIT model?

6 A No, the model that is the Harris model that  
7 leads to this 1.04 number in the sentence that you're  
8 inquiring about. There's nothing to that about the  
9 assumption you mentioned. It's just a comparison of two  
10 groups.

11 Q Okay. But in your comparison of the two  
12 groups, did you assume that the intervention was the  
13 same in the COMMIT study and in the analysis that  
14 Dr. Harris undertook?

15 A No. You don't make any assumption of that kind  
16 one way or another. It's just a -- it's just an  
17 off-the-mark understanding of what you do. You just  
18 compare two groups.

19 Q Without taking into account any differences  
20 that might exist in the type of intervention in the  
21 COMMIT study versus the Dr. Harris model; correct?

22 A Right. There's nothing in the model that would  
23 ask you to make those kind of distinctions. The models  
24 that leads to this 1.04 number is -- think of it like

1 a -- scales, you have -- like the scales of justice, you  
2 put something on one side and you put something on the  
3 other. You don't have to tell the scale that it's an  
4 apple or a pear, it's just a comparison of the two  
5 things.

6 Q But in doing the comparison of two different  
7 groups, you want to have as many of the characteristics  
8 as possible to be similar; correct?

9 MR. MINTON: Object to the form.

10 MR. UGARTE: Object to the form. Vague and  
11 ambiguous.

12 THE WITNESS: I'll go with the vague and  
13 ambiguous.

14 MR. UGARTE: You can answer, Doctor, if you  
15 understand.

16 THE WITNESS: No. What I meant to say was I'm  
17 on the side of the objection here, so you'll have to  
18 clear that up for me.

19 BY MR. FORESTA:

20 Q Did you answer the question? And if you did, I  
21 apologize for asking it again. But to your knowledge,  
22 is the intervention that Dr. Harris considers in his  
23 model the same or similar to the intervention that was  
24 undertaken in the COMMIT study?

1 MR. MINTON: Object to the form. Asked and  
2 answered.

3 THE WITNESS: As far as the model is concerned,  
4 it's -- there is no consideration. It's like I was  
5 telling you about a scale where you put something on one  
6 side and something on the other, it's a comparison of  
7 two groups, and the model doesn't know if you're putting  
8 on lead weights or apples or bananas. There's just no  
9 call for an assumption like that. This model simply  
10 compares the difference between two groups.

11 BY MR. FORESTA:

12 Q The COMMIT study did not involve direct  
13 intervention in the members who were in the intervention  
14 communities; isn't that correct?

15 MR. MINTON: Object to the form of the  
16 question.

17 MR. UGARTE: Object to the form. Vague and  
18 ambiguous.

19 BY MR. FORESTA:

20 Q Direct intervention between the study  
21 investigators and the participants in the study.

22 MR. MINTON: Same objection.

23 THE WITNESS: Well, there were contacts from  
24 the study -- the people who conducted the study and the

1 participants, but I take it that you mean the various  
2 intervention programs of education and all the other  
3 things they did. Those were not one on one, but they  
4 were a variety of schemes that were thought to impact  
5 all the people in the community.

6 MR. FORESTA: I've literally run out of  
7 questions.

8 THE WITNESS: Well --

9 MR. FORESTA: I just want to --

10 THE WITNESS: Thank you.

11 MR. FORESTA: -- repeat -- I just want to  
12 repeat for the record my request that we get a copy of  
13 the CDC report that Dr. Wecker referred to before as  
14 part of his most recent analysis.

15 THE WITNESS: I've already asked my office to  
16 do that, and they told me that we were past our Federal  
17 Express date here, and it's about 190 pages long, and  
18 you and I agreed that we could send it out to you  
19 tomorrow, and that's what we're going to do.

20 Can we clear up what the court reporter has to  
21 go copy?

22 MR. MINTON: Do you want --

23 MR. BURTON: I think she's copying folder 5,  
24 which is the folder you have in front of you.

1 THE WITNESS: What's 5?

2 MR. FORESTA: Binder.

3 MR. BURTON: The binder. You're going to see  
4 send us the CDC report.

5 MR. MINTON: You want to read and sign or  
6 waive?

7 THE WITNESS: Read and sign.

8 She's got 5. Is that enough?

9 MR. MINTON: We're going to read and sign.

10 MR. BURTON: What did we decide to do with

11 Exhibit 4, Dr. Wecker, which is your copy of the  
12 monograph? To make a copy of it for the reporter?

13 THE WITNESS: Oh, that's up to you guys. I'm  
14 open to your suggestions. It's a big thick thing, and  
15 she's not anxious to copy it, but --

16 MR. MINTON: There is a note. He did find some  
17 notes on one table. Maybe you just want to copy that  
18 one table or whatever, or you can have Mike look at it  
19 or whatever, but there are notes -- there is a note at  
20 least on one page.

21 THE WITNESS: Page 31. Well, how about if we  
22 just send you page 31. I just circled the numbers on  
23 the right-hand side of the table, those are -- and we  
24 talked about those.



1 MR. FORESTA: Well, I certainly want any of the  
2 pages that have notes on it, but mechanically, what I'm  
3 going to have to do, then, is make a copy of the balance  
4 of the monograph and then have the exhibit sticker put  
5 on that. I don't know if anyone's got a problem with  
6 that.

7 MR. BURTON: Or why don't you have it copied  
8 and send it up here when you send the CDC report.

9 MR. UGARTE: You know, here's my only problem.

10 THE WITNESS: Yeah, I can do that. I can copy  
11 it -- if you don't mind, I can copy it at my office  
12 tomorrow and send it along with the CDC report, and it  
13 will have my notations, including the one -- I think  
14 it's the only one -- on page 31.

15 MR. FORESTA: Does it have the exhibit sticker  
16 number on it?

17 THE WITNESS: Yes, it does.

18 MR. FORESTA: All right.

19 MR. UGARTE: Dr. Wecker, are you familiar  
20 enough with the notes on that to say that they're your  
21 notes, or do you know if they're all your notes? I  
22 mean, that's my only concern, is the --

23 THE WITNESS: Well, there was some handwriting  
24 on them, but I had no idea -- it's the way it came to

Wecker

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1 me, so I think it's fine. It says, "HVC737 1995," I  
2 have no idea what that means.

3 MR. MINTON: It's a library --

4 THE WITNESS: It's a library kind of thing.  
5 I'll make a copy and send it along with the CDC thing.

6 MR. MINTON: He's going to send it to you,  
7 Rich, along with the other thing, and you can get it  
8 delivered to the plaintiffs.

9 MR. FORESTA: Thank you, Dr. Wecker.

10 THE WITNESS: Okay, bye.

11 THE VIDEOGRAPHER: Thank you. This concludes  
12 today's deposition of Dr. Wecker. The number of  
13 videotapes used is three. The time is 8:45, and we are  
14 going off the record.

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I, WILLIAM E. WECKER, Ph.D., do hereby  
declare under penalty of perjury that I have read the  
foregoing transcript; that I have made such corrections  
as noted herein, in ink, initialed by me, or attached  
hereto, that my testimony as contained herein, as  
corrected, is true and correct.

EXECUTED this \_\_\_\_\_ day of \_\_\_\_\_,  
2000, at \_\_\_\_\_, \_\_\_\_\_  
(City) (State)

\_\_\_\_\_  
WILLIAM E. WECKER, Ph.D.

1 STATE OF CALIFORNIA )  
2 COUNTY OF CONTRA COSTA ) ss

3  
4

5 I, the undersigned, a Certified Shorthand  
6 Reporter of the State of California, do hereby  
7 certify:


8 That the foregoing proceedings were taken  
9 before me at the time and place herein set forth; that  
10 any witnesses in the foregoing proceedings, prior to  
11 testifying, were placed under oath; that a verbatim  
12 record of the proceedings was made by me using machine  
13 shorthand which was thereafter transcribed under my  
14 direction; further, that the foregoing is an accurate  
15 transcription thereof.

16 I further certify that I am neither  
17 financially interested in the action nor a relative or  
18 employee of any attorney of any of the parties.

19 IN WITNESS WHEREOF, I have this date  
20 subscribed my name.

21 Dated: DECEMBER 15, 2000

22  
23  
24

  
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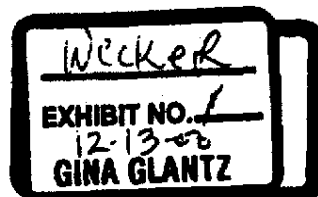
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Falise, et al. v. The American Tobacco Company, et al.**Report of William E. Wecker, Ph.D., In Response To  
Dr. Cummings's September 22, 2000 Supplemental Report**

December 4, 2000

My name is William E. Wecker. I am a statistician and applied mathematician. I received the Bachelor of Science degree (Basic Sciences) from the United States Air Force Academy and both the Master of Science degree (Operations Research) and Doctor of Philosophy degree (Statistics and Management Science) from the University of Michigan. I have served on the faculties of the University of Chicago, the University of California, Davis, and Stanford University where I taught statistics and applied mathematics at the graduate level and did research in statistical theory, statistical methods, and applied mathematics for seventeen years. I am currently President of William E. Wecker Associates, Inc., an applied mathematics consulting firm located in Novato, California. I am a member of the American Statistical Association, the Institute of Mathematical Statistics, and the Society for Risk Analysis. I have served as associate editor of the Journal of the American Statistical Association for four years and of the Journal of Business and Economic Statistics for seventeen years.

Counsel for Defendants has asked me to review and comment on the materials, analyses and calculations referenced in Dr. Cummings's September 22, 2000 report that concern his estimate of the effect of education about smoking on smoking quit rates. I have two principal conclusions: First, Dr. Cummings's estimate of the effect of education about smoking on the smoking quit rate based on his analysis of the COMMIT data is statistically flawed and overstated. Second, Dr. Cummings's estimate of the effect of education about smoking on smoking quit rates contradicts Dr. Harris's estimated effect of information about smoking on smoking quit rates and shows that Dr. Harris's smoking "attributable" claims estimate is overstated.



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**I. DR. CUMMINGS'S ESTIMATED EFFECT OF EDUCATION ABOUT SMOKING ON THE SMOKING QUIT RATE IS STATISTICALLY FLAWED AND OVERSTATED**

Dr. Cummings bases his claim that the "COMMIT education program was successful in significantly boosting quit rates by 1.8% overall"<sup>1</sup> on a 1995 paper that he coauthored regarding COMMIT. But Dr. Cummings's 1995 published analysis was refined in his 1997 published analysis by considering other factors that influence the smoking quit rate, such as gender, age, income and alcohol use. The result of Dr. Cummings's more refined analysis of the COMMIT data shows that the COMMIT intervention program had a statistically insignificant effect on the smoking quit rate.<sup>2</sup>

In addition, the population studied in Dr. Cummings's 1995 and 1997 published analyses is the general population of men and women from the intervention communities. The population at issue in this case is predominately male and blue collar.<sup>3</sup> I analyzed the male members of the COMMIT population using the same methods that Dr. Cummings used in his 1995 paper. I found no statistically significant effect of the COMMIT intervention on the male members of the COMMIT population.<sup>4</sup> I also analyzed the male members of the COMMIT population using the same methods that Dr. Cummings used in his 1997 paper. Again, I found no statistically significant effect of the COMMIT intervention on the male members of the COMMIT population.<sup>5</sup>

I also analyzed the blue collar male members of the COMMIT population using the same methods that Dr. Cummings used in his 1995 paper. I found no statistically significant effect of the COMMIT intervention on the blue collar male members of the COMMIT

<sup>1</sup> K. Michael Cummings, Supplemental Expert Report, *Falise, et al. v. The American Tobacco Company, et al.*, September 22, 2000 cites The COMMIT Research Group, Community Intervention Trial for Smoking Cessation (COMMIT): 1. Cohort Results from a Four-Year Community Intervention, *American Journal of Public Health*, Feb 1995.

<sup>2</sup> N. Hymowitz, K. Michael Cummings, et al., Predictors of smoking cessation in a cohort of adult smokers followed for five years, *Tobacco Control*, 1997;6 (suppl 2), p. S60 (table 2) and my computer file tab70/cascade.sas.

<sup>3</sup> K. Michael Cummings, Supplemental Expert Report, *Falise, et al. v. The American Tobacco Company, et al.*, September 22, 2000, p. 2.

<sup>4</sup> See my computer file tab72/diff18\_male.sas.

<sup>5</sup> See my computer file tab70/cascade.sas.

population.<sup>6</sup> I also analyzed the blue collar male members of the COMMIT population using the same methods that Dr. Cummings used in his 1997 paper. Again I found no statistically significant effect of the COMMIT intervention on the blue collar male members of the COMMIT population.<sup>7</sup>

Furthermore, the 1.8 percent increase in quit rates, cited in Dr. Cummings's supplemental report, does not consider or control for the quit rate differences between the intervention and control communities that existed prior to the COMMIT intervention.<sup>8</sup> I found that the intervention communities had higher smoking quit rates than the control communities even before the COMMIT intervention. When I refined the 1995 analysis by controlling for the quit rate differences between the intervention and control communities prior to the intervention, I found that there was no significant intervention effect.<sup>9</sup>

Finally, the COMMIT intervention included more than just education about smoking. It also included efforts to increase taxes, constraints on advertising and promotion of tobacco products, policies related to the sale and distribution of cigarettes, and restrictions on smoking in public places. Dr. Cummings's analysis of the COMMIT intervention does not and cannot distinguish any effect of education from the effects of efforts to increase taxes, constraints on advertising and promotion of tobacco products, policies related to the sale and distribution of cigarettes, or restrictions on smoking in public places. Therefore, Dr. Cummings's claim that "COMMIT education program was successful in significantly boosting quit rates by 1.8%

<sup>6</sup> See my computer file tab72/diff18\_maBC.sas.

<sup>7</sup> See my computer file tab70/cascade.sas. Notably, when I added indicators for occupation to Dr. Cummings's analysis, I found that quit rates for blue collar workers do not differ significantly from those of workers in other occupations.

<sup>8</sup> See my computer file tab71/logisticRegression.sas. Community Based Interventions for Smokers. The COMMIT Field Experience. NIH National Cancer Institute. Monograph 6 1995, Ch. 3, Table 3.

<sup>9</sup> See my computer files tab72/diff18\_88.sas. Community Based Interventions for Smokers. The COMMIT Field Experience. NIH National Cancer Institute. Monograph 6 1995, Ch. 3, Table 3.

<sup>10</sup> Community Based Interventions for Smokers. The COMMIT Field Experience. NIH National Cancer Institute. Monograph 6 1995, pp. 41, 78, 80, 84.

overall"<sup>11</sup> is flawed because his analysis, at best, is an analysis of the COMMIT intervention program of which education was but a part.

## II. DR. CUMMINGS'S ESTIMATE DEMONSTRATES THAT DR. HARRIS'S ESTIMATE OF SMOKING "ATTRIBUTABLE" CLAIMS IS OVERSTATED

As a basis for his conduct "attributable" claims estimate, Dr. Harris claims that if the Defendants had given information about smoking to the Manville Trust claimants then their quit rate would have been greatly increased.<sup>12</sup> Dr. Harris's claim of a greatly increased quit rate is contradicted by Dr. Cummings's 1995 and 1997 analyses and by my analyses in section I. Moreover, I applied Dr. Harris's quit rate model<sup>13</sup> to the data for men from COMMIT. I found that Dr. Harris's model estimates a statistically insignificant quit rate of only 1.04 times higher for the group "educated about smoking."<sup>14</sup>

Documentation of my analyses and charts is included in the electronic media provided with this report.



William E. Wecker

<sup>11</sup> K. Michael Cummings, Supplemental Expert Report, *Falisc, et al. v. The American Tobacco Company, et al.*, September 22, 2000 cites The COMMIT Research Group, Community Intervention Trial for Smoking Cessation (COMMIT): I. Cohort Results from a Four-Year Community Intervention, *American Journal of Public Health*, Feb 1995.

<sup>12</sup> JE Harris, Report 6, Expert Report in *Falisc, et al. v. American Tobacco Co., et al.*, June 14, 2000, p. 18.

<sup>13</sup> JE Harris, Report 6, Expert Report in *Falisc, et al. v. American Tobacco Co., et al.*, June 14, 2000, p. 18.

<sup>14</sup> See my computer file /tab65/nqr3s\_commit.do and my computer files in /tab66-69.



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**Attachment A**

**Additional Materials Considered**

1. K. Michael Cummin Expert Report, Falisse, et al. v. The American Tobacco Company, et al., September 22, 2000.
2. Data files collected from the COMMIT smoking cessation study.

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COMMUNITY INTERVENTION TRIAL  
FOR SMOKING CESSATION (COMMIT):  
I. Cohort Results from a Four-Year  
Community Intervention



The COMMIT Research Group\*

### Introduction

As a primary objective in the goal to reduce cancer mortality rates in the United States, the National Cancer Institute (NCI) has specified a rapid reduction in the prevalence of smoking by adults. Although this prevalence steadily declined in the 1980s, more than 50 million Americans continued to smoke.<sup>1</sup> This fact showed the need for effective methods to help smokers quit. Since the early 1980s, the NCI has supported an extensive program of smoking cessation studies,<sup>2</sup> in which various interventions are separately developed and evaluated. These studies, which focus on specific agents of change (e.g., counseling by physicians, clinical interventions, work-site programs), have identified the most efficacious interventions among individuals and groups who volunteer to participate.

In 1986, the NCI funded the Community Intervention Trial for Smoking Cessation (COMMIT), a randomized controlled trial at the community level based on proactive efforts to reach smokers through existing social institutions.<sup>3</sup> The philosophy was to bring diverse organizations, institutions, and individuals together to conduct smoking cessation activities. It was assumed that a comprehensive communitywide strategy would make it difficult for residents to avoid exposure to messages about the importance of non-smoking and would alert smokers to the many opportunities for cessation. Building on the results of previous studies,<sup>2</sup> COMMIT combined a variety of interventions intended to help smokers achieve and maintain cessation. The assumption was that the combination would be more effective than the sum of the individual component effects.

Community-based health promotion programs that include smoking cessation

efforts have already been conducted, especially those focused on heart disease prevention<sup>4-7</sup> as well as other health goals.<sup>8</sup> In these earlier projects, however, efforts to change smoking behaviors were embedded in interventions designed to affect multiple risk factors simultaneously. Furthermore, only a few communities were used, and these were nonrandomly assigned to conditions, making it difficult to separate the effects of intervention activities from the inherent differences between communities.

In COMMIT, smoking was the only behavior targeted for intervention. Moreover, among community-based smoking-control studies, COMMIT was unique in that it randomly assigned communities to intervention, and it included a sufficient number of community pairs to provide good statistical power for detecting intervention effects on smoking cessation rates using the community as the unit of analysis.<sup>9</sup> The trial involved 11 matched pairs of communities: 10 in the United States and 1 in Canada (see Appendix B). Within each pair, one community was randomly assigned to intervention and the other served as comparison.

The design of COMMIT focused on the outcome for "heavy" cigarette smokers (those who smoked 25 or more cigarettes per day), whose smoking prevalence rates have been slower to decline

\*See Appendix B for a complete listing of the members of the group.

Sylvan B. Green, MD, assumes full responsibility for the content and integrity of the paper.

Requests for reprints should be sent to William R. Lynn, National Cancer Institute, Executive Plaza North, Suite 241, Bethesda, MD 20892.

This paper was accepted November 9, 1994.

Editor's Note. See related editorials by Susser (p. 156) and Fisher (p. 159) in this issue.

### ABSTRACT

**Objective.** The primary hypothesis of COMMIT (Community Intervention Trial for Smoking Cessation) was that a community-level, multi-channel, multi-intervention would increase quit rates among cigarette smokers, with heavy smokers ( $\geq 25$  cigarettes per day) of priority.

**Methods.** One community within each of 11 matched community pairs (10 in the United States, 1 in Canada) was randomly assigned to intervention. Endpoint cohorts totaling 10 019 heavy smokers and 10 328 light-to-moderate smokers were followed by telephone.

**Results.** The mean heavy smoker quit rate (i.e., the fraction of cohort members who had achieved and maintained cessation at the end of the trial) was 0.180 for intervention communities versus 0.187 for comparison communities, a nonsignificant difference (one-sided  $P = .68$  by permutation test; 90% test-based confidence interval (CI) for the difference =  $-0.008$  to  $0.019$ ). For light-to-moderate smokers, corresponding quit rates were 0.206 and 0.275; this difference was significant ( $P = .004$ ; 90% CI =  $0.014$  to  $0.047$ ). Smokers in intervention communities had greater perceived exposure to smoking control activities, which correlated with outcome only for light-to-moderate smokers.

**Conclusions.** The impact of this community-based intervention on light-to-moderate smokers, although modest, has public health importance. This intervention did not increase quit rates of heavy smokers; reaching them may require new clinical programs and policy changes. (*Am J Public Health*. 1995;85:183-192)

than those of "light-to-moderate" smokers. Because heavy smokers represent one third of all cigarette smokers but account for nearly one half of all lung and other smoking-related cancers,<sup>10</sup> they are a group especially in need of targeting. Thus, reaching this population via a multichannel communitywide strategy was considered the most important aspect of COMMIT, although it was assumed that if this group could be reached, light-to-moderate smokers would also be affected.

Thus, the primary hypothesis tested in COMMIT was that a defined intervention, delivered through multiple community sectors and organizations over a 4-year period and using limited external resources, would result in higher quit rates among heavy cigarette smokers in the intervention communities than in the comparison communities. The outcome measure testing this hypothesis was specified as the quit rate among a cohort of heavy smokers to be followed in each community. "Quit rate" was defined as the fraction of cohort members who had achieved and maintained cessation for at least 6 months at the end of the trial. The expected quit rate for heavy smokers in the comparison communities was 0.15, and trial planners postulated a 0.25 quit rate in the intervention communities after the 4-year intervention. Beyond analysis of quit rates in light-to-moderate smokers was also planned: the outcome measure reported here are the quit rates in both smoker cohorts. Cross-sectional changes in prevalence were measured as another test of the intervention and are reported separately.<sup>11</sup>

### Methods and Materials

Because the COMMIT intervention was community based, the community was chosen as the unit of randomization. The two communities within each of the 11 selected pairs were matched for geographic location (state or province), size, and general demographic factors.<sup>12</sup> According to data from the 1990 Census (1991 in Canada), community populations varied from 49 421 to 251 208 residents, with comparable means for the pooled intervention and comparison communities. Further details on the communities and the matching are presented elsewhere (although this earlier report used 1980/1981 Census data).<sup>12</sup>

From January to May 1988, a telephone survey was conducted to estimate baseline prevalence and identify cohorts of heavy and light-to-moderate smokers within each community. Following that,

the communities within each matched pair were randomized, one to the intervention and the other to the comparison condition.<sup>9</sup> Intervention started after randomization, beginning with mobilization of the communities. Specific intervention activities took place from January 1989 through December 1992, during which time cohort members were contacted annually by telephone. The final such contact occurred between January and May 1993, followed by the final prevalence survey from August 1993 to January 1994.

### Trial Organization and Intervention

COMMIT was a partnership among 11 participating research institutions, the corresponding local communities, a coordinating center responsible for data management, NCI program staff, and NCI biostatisticians. A considerable amount of community mobilization was required to set the stage for protocol implementation.<sup>13</sup> Each community formed a community board that consisted of key community representatives, was charged with representing the COMMIT project to the community, and had overall responsibility for planning implementation of COMMIT interventions.

Intervention focused on four primary channels: public education through the media and communitywide events; health care providers; work-sites and other organizations; and cessation resources. Within these channels, the protocol specified 58 mandated activities, defined so they could be carried out largely by community volunteers or local staff or agencies with limited external resources. These activities were implemented through four community task forces (representing the four channels), each having a set of general goals and a set of measurable process objectives that guided the activities. Although COMMIT aimed at creating a demand for cessation services, funds were not provided to support such services directly. Appendix A summarizes the major mandated activities by task force; these are described in more detail elsewhere.<sup>14-17</sup>

A program records system, monitored by the coordinating center, was developed to check implementation of the protocol.<sup>18</sup> Process objectives for each protocol element established the minimum level of activity to be conducted annually in each community. For the four intervention channels, the mean level of attainment across the 11 sites varied from 90% to 93%. Nearly all mandated activi-

ties were implemented in a timely fashion.<sup>19</sup> Optional activities (such as training for pharmacists, mass media cessation campaigns, etc.) were also permitted by the protocol, and one or more optional activities were implemented in each intervention site. Because of the inherent variability of community needs and capabilities, COMMIT sought to strike a balance between standardization of activities across sites and the need for community tailoring.<sup>19</sup>

Each intervention community recruited a field director, who had primary responsibility for ensuring that the intervention protocol was implemented and who was accountable to both the community board and the research institution. The field director hired and supervised an office manager and, on average, two full-time intervention staff; all worked with the task forces to implement mandated activities. Including salaries, COMMIT provided each intervention community with an average of \$220 000 per year for 4 years to support the intervention.

### Identification of Endpoint and Evaluation Cohorts

The baseline survey was conducted centrally using a modified random-digit-dialing technique with community-specific geographic screening to identify households within the targeted areas.<sup>11</sup> The mean response rate (across communities) for the household-rostering portion of the survey was 83.7%, with approximately 5400 households contacted in each of the 22 communities; response rates have been recalculated since an earlier publication.<sup>12</sup> Of the smokers identified as such from the household rostering, 91.5% completed an extended interview. Based on this interview, a smoker was defined as someone who had smoked at least 100 cigarettes in his or her lifetime and who smoked currently at the time of interview; a heavy smoker was defined as one who reported smoking 25 or more cigarettes per day (either per weekday or per weekend day), while a light-to-moderate smoker reported smoking fewer than this number.

Approximately 550 heavy smokers and 550 light-to-moderate smokers between 25 and 64 years of age were identified in each community to be followed prospectively. An 80% sample was randomly drawn from each of these groups to form "endpoint cohorts," in whom smoking quit rates were to be determined for the principal COMMIT

outcome measures. The remaining 20% of the smoker groups served as "evaluation cohorts"<sup>20</sup> to assess three issues related to trial goals: (1) the impact of COMMIT on intervention program awareness, receptivity, and participation; (2) recognition of smoking as a public health problem; and (3) change in the social acceptability of smoking. Results from the evaluation cohorts will be presented in a later paper.

Endpoint cohort members were not explicitly notified of their status as cohort members. However, respondents were informed that they would be contacted annually. In 1993, at the final annual contact to assess smoking status, the endpoint cohorts were also asked a set of questions to assess intervention program awareness and participation. These questions were asked after smoking status was ascertained, so there was no possibility that asking such questions could affect estimates of quit rates. These questions also estimated awareness of and participation in tobacco control activities for comparison communities.

Steps were taken to contact cohort members even if they moved out of the community. To minimize attrition, various methods were used to obtain new telephone numbers for members who could not be reached at their last known number; these methods began with Directory Assistance, followed by telephone contact with individuals whose names the cohort members may have provided, followed by searches by credit bureaus. The only information accessed in these inquiries was name, age, sex, address, and telephone number. At the final annual contact, cohort members who declined to be interviewed were asked if they would respond to an abbreviated set of questions about their current smoking status. Members not contacted by telephone were mailed these questions. These methods yielded data on current smoking status from an additional 6.7% of the combined endpoint cohorts.

To ensure that the cohorts remained as representative as possible of their communities, minimal telephone contact occurred during the trial and no intervention activities were directed specifically at individual cohort members. Trial investigators and local program staff were not informed of which smokers were selected for the COMMIT cohorts and were blinded to smoking status data during the trial. Population-based surveys were conducted centrally by independent contractors. All surveys were identified as being

sponsored by the US Public Health Service or, in Canada, by the University of Waterloo and McMaster University, but none was linked to local COMMIT activities. Details have been presented elsewhere.<sup>12</sup>

### Statistical Analysis

Separate analyses were performed using data from the 10 019 individuals in the heavy smoker endpoint cohort and the 10 328 members of the light-to-moderate smoker endpoint cohort, as defined at baseline. For the primary outcome measure of COMMIT, a "quitter" was defined as a cohort member who, at the final annual contact in 1993, reported not smoking any cigarettes for the preceding 6 months or longer. The quit rate (i.e., the fraction of cohort members who met this definition of quitting) was determined for each of the 22 communities, and the differences in quit rates between the intervention and comparison community of each pair were calculated.

Significance testing was done using a permutation test<sup>21</sup> accounting for the fact that communities (rather than individuals) were randomized and that this randomization was performed within community pairs. To perform the permutation test for a specific outcome variable, the mean of the 11 pairwise differences between intervention and comparison communities was calculated for each of the  $2^{11}$  (= 2048) equally likely ways that the intervention assignments could have occurred during randomization. The rank of the observed mean among all 2048 possible means provided the significance level. As specified during the design phase of COMMIT,<sup>9,12</sup> one-sided permutation tests were used to analyze intervention effects. Permutation tests were also used to determine test-based confidence intervals (CIs) for the differences between intervention and comparison conditions; 90% confidence intervals are reported, corresponding to one-sided tests at the  $P = .05$  level. Two-sided permutation tests were used to analyze comparability of follow-up (response rates) between intervention and comparison communities. When intervention effects were determined separately within subsets of cohort members defined by demographic factors, two-sided permutation tests were used to investigate the statistical interactions (i.e., the extent to which observed differences in intervention effects between subsets were consistent with chance).

Quit rates of intervention and comparison communities were compared in

two ways. The first approach used the observed quit rates—namely, the fraction of those quitting among all individuals who provided information on their smoking status at the 1993 contact. This analysis omits those with missing data in 1993, which is equivalent, for point estimation, to imputing the quit rates of those individuals with known outcome to those with missing data. The assumption underlying such analysis is that the unknown outcomes are missing completely at random (MCAR).<sup>22</sup>

The second approach categorized individuals separately within each community into strata based on factors related to the final smoking outcome. Within each stratum, the quit rate of those not missing at final follow-up was used as the imputed probability of quitting for those with missing data. The quit rate for each community was then estimated by averaging over all cohort members in that community, with each known quitter assigned the value 1, each known continued smoker assigned the value 0, and each missing person assigned the quit probability that had been estimated for that individual's stratum. Such analysis is based on the assumption that the unknown outcomes are missing at random (MAR),<sup>22</sup> conditional on stratum membership. This assumption is less restrictive than missingness completely at random, so this procedure may be preferable to the MCAR analysis.

For this imputation, 16 strata were defined within each community; for each of these strata, data on those known in 1993 were used to impute quit rates for those missing in 1993. Initial stratification was done by reported smoking status on intermediate follow-up contacts in 1991 and 1992 (with each respondent classified as smoker, quitter, or missing), producing nine possible strata. Eight of these strata, representing individuals with one or more nonmissing observations in 1991 and 1992, were used without further subdivision. Those with missing information in both 1991 and 1992 were further classified according to 1990 status as smoker or quitter, thus producing two additional strata. For those with missing information in all three intermediate years and for those in a stratum with no individuals known in 1993, imputation was based on the two baseline variables selected as the most important variables in a stepdown logistic regression procedure<sup>23</sup> for the heavy smoker cohort using data from all 22 communities; these variables were time to the first cigarette of the morning (less

TABLE 1—Numbers (n) of Individuals in the Cohorts<sup>a</sup> and Fraction (f) of Those Who Met the Definition of Quitting, with Imputation for Those Unknown in 1993 (MAR Analysis)<sup>b</sup>

Pair	Heavy Smoker Cohort (n = 10 019)					Light-to-Moderate Smoker Cohort (n = 10 328)				
	Intervention (n = 4976)		Comparison (n = 5043)		Dif- ference	Intervention (n = 5177)		Comparison (n = 5151)		Dif- ference
	n	f	n	f		n	f	n	f	
1	442	0.139	435	0.205	-0.066	504	0.279	519	0.266	-0.007
2	53	0.163	489	0.202	-0.039	475	0.304	453	0.267	0.037
3	47	0.164	464	0.163	0.002	443	0.315	448	0.252	0.064
4	428	0.204	497	0.249	-0.045	463	0.345	475	0.299	0.046
5	440	0.183	458	0.160	0.022	473	0.342	472	0.332	0.010
6	459	0.164	454	0.186	-0.022	470	0.306	482	0.299	0.007
7	432	0.262	451	0.230	0.032	463	0.332	475	0.303	0.028
8	455	0.193	434	0.169	0.024	473	0.334	464	0.254	0.080
9	445	0.215	462	0.127	0.088	492	0.291	456	0.263	0.027
10	426	0.136	451	0.172	-0.036	479	0.244	467	0.256	-0.012
11	415	0.155	448	0.189	-0.034	442	0.273	440	0.218	0.055
Community mean		0.180		0.187	-0.007*		0.306		0.275	0.030**

<sup>a</sup>In this table, represents the sum of observed outcome and those with imputed outcome. Estimates of quit rates based on such n have greater uncertainty than would occur with the sum of n if all had been observed.

<sup>b</sup>MAR = missing at random.

\*P (one-sided) = .88; 90% confidence interval = 0.031, 0.019.

\*\*P (one-sided) = .004; 90% confidence interval = 0.014, 0.047.

than 10 minutes, 10 to 30 minutes, more than 30 minutes) and age (25 to 39 years, 40 to 64 years). To attain more stable estimates, the six additional strata formed by cross-classification of these variables, quit rates for each stratum were obtained for all individuals in the community with known information in 1993, including those with known intermediate smoking status.

In separate analyses, logistic regression was used to adjust for possible imbalance in individual-level covariates. Baseline covariates were chosen a priori because they were considered to be predictive of quitting cigarette smoking. The prognostic value of each covariate was first studied one at a time, with significance testing based on a logistic model with a single term for the covariate plus a separate intercept for each of the 22 communities. The covariates were then included together in a logistic model, along with a separate intercept for each community pair; stepdown regression was used to remove covariates not significantly prognostic (at the  $P = .05$  level) when adjusted for other variables in the model. This stepwise procedure was done for the heavy smoker cohort; the selected variables were also used for the light-to-moderate smoker cohort although coefficients

were obtained separately for each cohort. Because these models included no intervention indicator, they could be used to predict outcome under the null hypothesis of no intervention effect. By averaging predictions over individuals in each community, it was possible to determine residuals between observed and predicted quit rates. Differences in these residuals between the intervention and comparison communities of each pair were then calculated as a measure of intervention effect adjusted for baseline covariates, and a permutation test was performed on these paired differences.<sup>9</sup>

Using the data on perceived receipt of smoking control activities (awareness and participation), we calculated five "receipt indices," each associated with a major component of the COMMIT intervention, and three additional indices, which represent more general questions about tobacco control activities. An overall assessment was obtained by summing these eight separate indices. For this summary measure, each component index was "standardized" by subtracting its mean (based on individuals in the comparison communities) and dividing the remainder by its within-community standard deviation (obtained from analyses of variance). Standardization was done so

that the separate component indices would have equivalent weights in the summary measure.

For analyses of number of cigarettes smoked, each individual was asked to provide estimates of daily consumption separately for weekdays and weekends, and these were combined into a daily mean. At baseline, the median daily cigarette consumption was 30 for heavy smokers and 15 for light-to-moderate smokers.

## Results

As has been noted, COMMIT was a randomized trial with a sample size of 11 matched pairs of communities. In tables of results, these pairs are listed in arbitrary order and labeled 1 through 11; the individual communities are not identified. The order is the same across tables but does not correspond to the order in which the communities are listed in Appendix B.

## Data Response Rates for Smoking Status Information

Data response rates (percentages of cohort members who provided smoking status at the final contact in 1993) were calculated separately by cohort. For the heavy smoker cohort, the means of the 11 community-level rates for the intervention communities, 67.9%, and the comparison communities, 67.8%, were virtually identical (two-sided  $P = .88$  by permutation test). The corresponding rates for the light-to-moderate smoker cohort were 64.2% and 65.0%, also not significantly different ( $P = .42$ ). There was much variability across communities but relatively little within pairs.

Most of the cohort members who were classified as nonresponders were those who could not be located, 28.6% of members (mean across communities); an additional 2.4% were reported deceased. For the remaining 2.8% (2.9% across intervention communities, 2.6% across comparison communities), the respondents refused to be reinterviewed or there was a problem obtaining the interview. Analysis of the heavy smoker cohort showed that attrition tended to be higher for younger, single, less educated respondents.

## Cohort Quit Rates

Quit rates with imputation for missing values, using the MAR analysis described under Methods, are shown in Table 1. For the heavy smoker cohort, the

mean quit rate of the 11 intervention communities was 0.180, compared with 0.187 for the 11 comparison communities (one-sided  $P = .68$  by permutation test). The 90% test-based confidence interval for the difference ( $-0.031, 0.019$ ) includes zero. In contrast, the corresponding quit rates for the light-to-moderate smoker cohort were 0.306 and 0.275, and the difference of 0.03 (i.e., an additional 3% of light-to-moderate smokers quitting) was statistically significant ( $P = .004$ ; 90% CI = 0.014, 0.047).

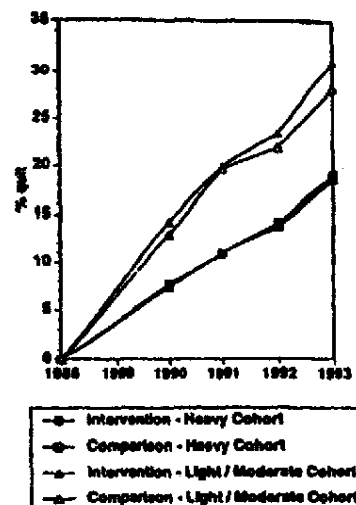
The observed quit rates (MCAR analysis) yielded quite similar results. For the heavy smoker cohort, the mean quit rate of the 11 intervention communities was 0.180 compared with 0.190 for the 11 comparison communities ( $P = .63$ ; 90% CI =  $-0.021, 0.021$ ). The corresponding quit rates for the light-to-moderate smoker cohort were 0.309 and 0.280, and the difference was statistically significant ( $P = .004$ ; 90% CI = 0.015, 0.045).

A subsidiary MCAR analysis performed with adjustment for individual-level baseline covariates. Ten covariates, chosen a priori, were first investigated individually for prognostic value within the heavy smoker cohort (Table 2). Stepwise regression selected five of these for use in a multivariate analysis: age, time to first cigarette, desire to quit, marital status, and presence of another smoker in the household. Permutation tests on the residuals between observed and predicted quit rates, comparing intervention and comparison communities, gave results similar to the unadjusted analyses. For the heavy smoker cohort, there were 6717 individuals with known covariates and outcome; the adjusted analysis was not significant ( $P = .66$ ). For the light-to-moderate smoker cohort, there were 6316 individuals with known data; the adjusted analysis was highly significant ( $P = .003$ ). Thus, adjustment for possible imbalances in prognostic factors did not alter the conclusions derived from unadjusted analyses.

To gauge the public health impact on all smokers, the observed quit rates (MCAR) from both the heavy and light-to-moderate smoker cohorts were weighted in proportion to their prevalence at baseline in each community. The mean combined quit rate was 0.265 for intervention communities and 0.247 for comparison communities. The combined difference of 0.018 (i.e., an additional 1.8% of smokers quitting) was significant ( $P = .031$ ; 90% CI = .002, 0.034).

TABLE 2—Observed Quit Rates in the Heavy Smoker Cohort, by Categories of Baseline Covariates

	n	Fraction Quitting	P (Two-Sided)
Age, y			
40-64	3649	0.206	<.0001
25-39	3138	0.185	
Sex			
Female	3033	0.176	.028
Male	3780	0.196	
Education			
No college	3014	0.192	.56
Some college	3787	0.183	
Age when started smoking, y			
<17	3170	0.180	.067
≥17	3640	0.193	
Cigarettes per day, no.			
≤30	4076	0.192	.17
>30	2709	0.179	
Time to first cigarette			
<10 min	3202	0.186	<.0001
10-30 min	2261	0.190	
>30 min	1335	0.234	
Desire to quit			
Not at all	1165	0.156	.0001
A little	1050	0.173	
Somewhat	2074	0.184	
A lot	2489	0.208	
Quit attempts in past year			
No or unknown	4358	0.179	.078
Yes	2455	0.201	
Marital status			
Married or live with partner	4714	0.197	.0007
Other	2077	0.165	
Another smoker in household			
No	4282	0.199	.0008
Yes	2531	0.186	



Note. Different numbers of subjects contribute at each time point. MCAR = missing completely at random.

FIGURE 1—Observed quit rates (MCAR) over time for heavy and light-to-moderate smoker cohorts.

data represent the fraction of respondents at each time point who reported not smoking cigarettes for at least 6 months at that survey time. Both smoker cohorts showed a steady increase in quit rates for intervention and comparison communities. Although the number of cohort members contributing to each point varies by year, thus requiring caution in interpretation, Figure 1 suggests an emerging difference in quit rates between intervention and comparison groups for the light-to-moderate smokers over time, with no intervention effect on quit rates for the heavy smokers.

The observed quit rates (MCAR) for the intervention and comparison communities by age, sex, and educational level are shown in Table 3 for both smoker cohorts; these demographic factors were selected a priori as being of interest. The nominal  $P$  values should be interpreted with caution because of the multiple comparisons involved. One interaction test was statistically significant, suggesting that the intervention effect did differ in the light-to-moderate smoker cohort according to educational level, with most of the beneficial effect of the intervention seen in the lesser educated subgroup. The other subgroup differences in intervention effect are consistent with chance.

The design of COMMIT specified that the primary outcome measure was the fraction of cohort members who had achieved and maintained cessation at the end of the trial. For descriptive purposes only, we plotted observed quit rates in 1990, 1991, 1992, and 1993 (Figure 1) to show trends in quitting over time. The

TABLE 3—Numbers (n) of Individuals with Known Smoking Status and Community Mean Fraction (f) of Those Who Met the Definition of Quitting, within Demographic Subsets

Subset	Heavy Smoker Cohort						Light-to-Moderate Smoker Cohort					
	Intervention		Comparison		Difference	P*	Intervention		Comparison		Difference	P*
	n	f	n	f			n	f	n	f		
Age 40–64 y	1813	0.205	1836	0.208	–0.003	.58	1882	0.318	1638	0.297	0.021	.28
Age 25–39 y	1569	0.162	1569	0.171	–0.009	.72	1618	0.303	1690	0.259	0.044	.03
Interaction					.78							.65
Female	1459	0.176	1574	0.176	0.000	.50	1880	0.306	1921	0.277	0.029	.011
Male	1934	0.192	1846	0.201	–0.009	.73	1437	0.314	1415	0.284	0.031	.049
Interaction					.56							.86
No college	1458	0.193	1556	0.191	0.002	.45	1332	0.302	1443	0.248	0.055	.007
Some college	1929	0.178	1858	0.192	–0.013	.80	1975	0.309	1869	0.306	0.004	.33
Interaction					.24							.032

\*P values for intervention effect within subset are one-sided; interaction P values are two-sided.

TABLE 4—Differences in Receipt Indices, by Intervention Condition

Index (allowable Minimum–Maximum Values)	Heavy Smoker Cohort (n = 5950)				Light-to-Moderate Smoker Cohort (n = 5821)			
	Community Means		Difference	P*	Community Means		Difference	P*
	Intervention (n = 2972)	Comparison (n = 2978)			Intervention (n = 2890)	Comparison (n = 2931)		
Cessation resources (0–4)	0.61	0.650	0.041	.11	0.600	0.569	0.031	.11
Health care (0–6)	1.661	1.735	0.126	.023	1.353	1.299	0.054	.082
Work-sites (0–7)	2.137	2.137	0.042	.28	2.390	2.322	0.068	.20
Media and education (0–16)	7.833	7.858	0.175	.14	7.621	7.542	0.079	.29
Religious organizations (0–10)	2.762	2.762	–0.080	.70	2.976	2.912	0.065	.28
Programs and materials (0–10)	5.507	5.041	0.466	.011	5.485	5.056	0.409	.007
Events and contests (0–10)	2.954	2.970	0.784	.001	3.783	3.067	0.716	.001
Smoking unacceptability (0–10)	6.261	6.261	–0.006	.52	6.176	6.019	0.157	.18
Summary (standardized)	0.005	0.118	0.577	.012	0.386	–0.178	0.563	.004

Note. The receipt indices are associated with a major component of the COMMIT intervention; the last three represent general questions about tobacco control activities.

\*P values are one-sided.

### Number of Cigarettes Smoked

The daily number of cigarettes that an individual smoked was analyzed as an additional measure of behavioral change. Differences between baseline and final contact were calculated, with quitters having a value of zero at the final contact, and the median difference was determined for each community. For the heavy smoker cohort, the decrease in number of cigarettes smoked in the 11 intervention communities (community mean) was 9.2, compared with 8.9 in the comparison communities; the difference of 0.3 cigarettes per day was not significant ( $P = .13$ ). For the light-to-moderate smoker cohort, the corresponding values were 2.7 and 1.9; the difference of 0.8 reached statistical

significance at  $P = .03$ . These results are consistent with the quit rate analysis.

### Intervention Receipt Indices

In the heavy smoker cohort, data on intervention receipt indices were available (on average) for 59.4% of members in intervention communities and for 59.1% of members in comparison communities, amounting to a nonsignificant difference in data response rates ( $P = .79$ ); similarly, for the light-to-moderate smoker cohort, these rates were 55.9% and 57.1%, respectively ( $P = .20$ ). The observed data were used without imputation. Results are shown in Table 4; larger values of an index correspond to greater awareness and/or participation. All but two indices in the

heavy smoker cohort and all indices in the light-to-moderate smoker cohort showed a difference in favor of the intervention communities although some of these differences were not statistically significant by permutation test. Importantly, the summary measure was significantly greater for the intervention communities in both cohorts ( $P = .012$  among heavy smokers and  $.004$  among light-to-moderate smokers).

Even when statistically significant, the magnitudes of the differences in receipt indices were not large. The largest (and most significant) difference in both cohorts was for the index based on the respondents' evaluation of the increase in stop-smoking events and contests in their

community. More details of receipt indices are planned for a future paper. (A list of survey questions contributing to specific receipt indices is available from the authors.)

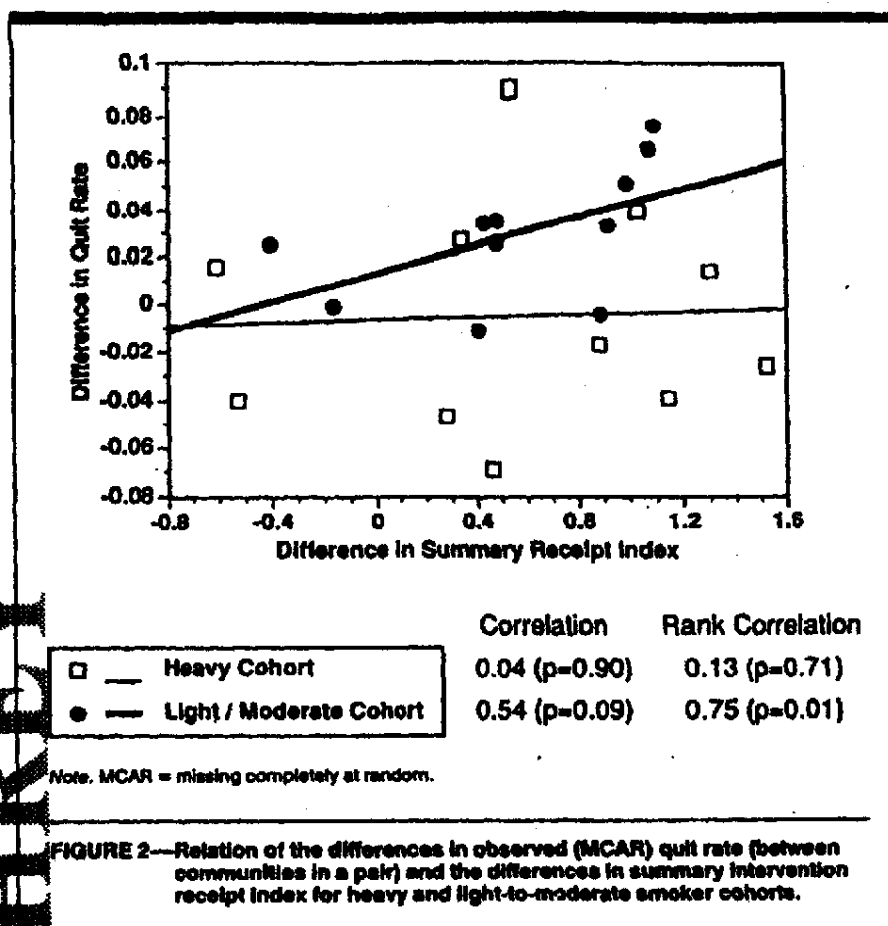
### Relation of Differences in Quit Rates and Receipt Indices

As one way of exploring the variability in quit rate differences across community pairs, we computed a receipt index difference for each community pair (using the standardized summary measure), which we then correlated with the MCAR quit rate difference in each community pair. As seen in Figure 2, the variability across community pairs in receipt index difference result in a correlation with differences in quit rates among the heavy smokers (rank order correlation = 0.13,  $P = .71$ ), but there was a significant correlation among the light-to-moderate smokers (rank order correlation = 0.75,  $P = .01$ ). This suggests that in the light-to-moderate smoker cohort where the COMMIT intervention did produce a behavioral change, the magnitude of this intervention effect was related to the magnitude of the difference in awareness of (or participation in) smoking control activities.

### Discussion

The COMMIT intervention did not significantly change the primary outcome measure—quit rate—among heavy smokers—where quitting was defined as having smoked no cigarettes for at least the preceding 6 months at the end of the trial. For the heavy smoker cohort, the mean quit rates for the intervention and comparison communities were nearly identical: 0.180 versus 0.187 (MAR analysis with imputation of missing values). Quitting in the comparison communities was somewhat greater than the expected rate of 0.15, but the anticipated intervention effect of increasing the quit rate to 0.25 clearly was not achieved.

There was, however, a statistically significant intervention effect in the light-to-moderate smoker cohort—quit rates of 0.306 versus 0.275—with the mean difference showing an additional 3% of such smokers quitting. The success of the COMMIT intervention in affecting smoking behavior among light-to-moderate smokers is an important public health finding. As an illustration, when the 3% mean difference in light-to-moderate cessation rates is extrapolated to the community level, it is reasonable to conclude that



more than 3000 smokers (in the target age interval of 25 to 64 years) in the 11 intervention communities were induced to quit beyond the naturally occurring secular trend. The higher quit rates for light-to-moderate smokers compared with heavy smokers are consistent with findings from the community trial in California<sup>24</sup> as well as with other smoking cessation studies.<sup>25</sup>

The analyses here showed little difference between men and women in the effect of the COMMIT intervention; there was no benefit for heavy smokers of either sex but there was an additional 3% quitting among light-to-moderate smokers of both sexes. Among light-to-moderate smokers, the less educated subgroup appeared more responsive to the intervention than the college-educated smokers. Given the report that more cessation activity has been occurring nationwide among smokers at higher education levels,<sup>26</sup> it is possible that the type of intervention provided by COMMIT adds little to secular trends among this group, whereas less educated smokers might benefit more from community-based antismoking messages.

The intervention receipt indices provide objective comparisons of the perceived level of activity in intervention and comparison communities. Differences in these indices were mostly in the expected direction, and differences in the summary index were statistically significant for both smoker cohorts. The magnitudes of these differences, however, were modest and may account for the lack of intervention effect for heavy smokers and for the modest intervention effect for light-to-moderate smokers.

The results show a moderately strong rank correlation between pairwise receipt index differences and pairwise quit rate differences for the light-to-moderate smoker cohort. Both heavy and light-to-moderate smokers in the intervention communities had greater perceived exposure to smoking control activities than their counterparts in comparison communities. However, for the heavy smokers, unlike for the light-to-moderate smokers, this exposure was not reflected in higher quit rates. This might be because the receipt of the COMMIT intervention was not large enough to affect heavy smokers, because 4 years was not long enough for a



community intervention to take hold and affect heavy smokers, or because a different type of intervention is necessary.

COMMIT also tried to ascertain intervention delivery and receipt by several special population surveys administered in both intervention and comparison communities. These data are still under analysis and will provide additional information that may help in interpreting the results reported here.

The COMMIT design had a number of important strengths. Intervention was assigned by randomization. Communities were both the unit of assignment and the unit of analysis, in a matched pair design,<sup>9</sup> the number of pairs, and the successful matching were all high<sup>27</sup> yielded sufficient statistical power to detect a relatively modest (but important) 3% difference in light-to-moderate smoking cessation rates. Moreover, the 90% confidence interval on the intervention difference in quit rate among heavy smokers indicates that an actual intervention benefit exceeding two percentage points for heavy smokers unlikely.

We consider the best estimates of cohort quit rates to be those based on stratum-specific imputation of missing values at final follow-up (MCAR analysis). However, using the observed quit rates (MCAR) gave almost the same results. Individuals in the cohorts were not direct participants in the trial but were simply respondents to telephone surveys, and thus missing data were due predominantly to failure to locate people with limited tracking information. Therefore, naive estimation assuming that all unlocated individuals were still smokers would provide such poor estimates of true quit rates as to be of no value, so this was not done.

Self-reports were used to determine trial endpoints; this is because a single biochemical measurement cannot validate sustained quitting (i.e., for 6 months or longer), it may be influenced by other nicotine sources, and it can only be collected from that subset of telephone survey participants willing to volunteer a sample. COMMIT did, however, undertake an ancillary study with salivary cotinine measurements (after all self-reports from cohort members were completed) to estimate the extent of false reporting of quitting and especially to estimate possible differential rates of such misrepresentation. Preliminary analysis of these data showed that misrepresentation rates in quitters from the heavy smoker cohort who participated in the ancillary

study were 5.1% in intervention communities versus 7.7% in comparison communities; for the light-to-moderate smoker cohort, the corresponding rates were 6.8% versus 8.8%. These differences were not statistically significant and were in the direction of reduced (rather than greater) false reporting in the intervention communities. Further analyses of this ancillary study will be reported in a later paper. Other researchers also have discussed this topic.<sup>24,29</sup>

There were two notable limitations of the COMMIT intervention that may have affected outcomes. First, the standardized protocol may have constrained some communities from undertaking activities that might have had greater impact. In general, however, community boards seemed quite satisfied with the protocol.<sup>30</sup> Second, the protocol did not permit emphasis on some kinds of policy or environmental changes that might have been quite powerful, such as working toward tax increases on cigarettes.

That the COMMIT intervention did not change quit rates of adult heavy smokers is disappointing but consistent with the findings of most other community studies on smoking cessation.<sup>7,24,31,32</sup> Achieving and maintaining cessation among heavy smokers is difficult. Thus far, only intensive clinical programs and pharmacological interventions have demonstrated a significant effect on the quit rates of heavy smokers,<sup>1,33</sup> and even they have had only a modest impact on cessation rates.

Based on sound principles of experimental design, COMMIT allowed a rigorous evaluation of its community-based intervention. As expected from secular trends, quitting did occur in comparison and intervention communities among heavy as well as light-to-moderate smokers. The intervention had a modest beneficial influence on this trend for light-to-moderate smokers, and thus it did produce an effect on smoking cessation with public health implications. Light-to-moderate smokers were responsive to broad-based community approaches to smoking control, and such efforts should continue. However, addicted heavy smokers are more resistant to change. Reaching these smokers may require new clinical programs and public policy changes.

Comparisons of the cohort results reported here with outcomes from the cross-sectional surveys are presented separately, along with additional discussion of the implications of COMMIT findings.<sup>11</sup> Continuing analyses of data from

COMMIT should provide further insights for future community-based health promotion programs. □

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## APPENDIX A—Key Mandated Activities for COMMIT Task Forces

## Public Education

- Provide media advocacy training for community board members
- Implement kick-off event
- Publicize smoking control plans
- Design and implement magnet events\*
- Publicize activities in other task force areas

## Health Care Providers

- Train physicians and dentists as trainers of peers in cessation techniques
- Provide basic and comprehensive training for physicians/dental professionals in smoking-cessation techniques for their patients
- Provide office consultation for motivating and training office staff to support cessation activities
- Promote smokers' network (mailing list)
- Promote smoke-free policies in health care facilities

## Work-Sites

- Offer presentations and on-site consultations to promote smoke-free policies in work-sites
- Hold annual smoking policy workshops
- Offer promotional activities accompanying magnet events\*
- Promote work-site stop-smoking incentives
- Disperse self-help materials
- Promote smokers' network (mailing list)

## Cessation Resources

- Develop and maintain a cessation resources guide
- Recruit heavy smokers into a smokers' network (mailing list) through magnet events\* and other activities
- Prepare and distribute a semiannual newsletter to smokers' network members

\*For example, Quit & Win contests, the Great American Smokeout, and Canada's Non-Dependence Day.

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Continued

## APPENDIX B—A Complete List of Institutions and Individuals Constituting the COMMIT Research Group

Members of the writing group for "Community Intervention Trial for Smoking Cessation (COMMIT): I. Cohort Results from a Four-Year Community Intervention" are indicated by one asterisk; those who wrote "Community Intervention Trial for Smoking Cessation (COMMIT): II. Changes in Adult Cigarette Smoking Prevalence" are indicated by two asterisks. (I) = intervention community; (C) = comparison community.

## National Cancer Institute

• *Division of Cancer Prevention and Control; Cancer Control Sciences Program (Bethesda, Md).* Acting Associate Director: Thomas J. Glynn, PhD; Coordinator, Smoking and Tobacco Control Program: Donald R. Shopland.

• *Division of Cancer Prevention and Control; Public Health Applications Research Branch (Bethesda, Md).* Chief: Marc Manley, MD, MPH; COMMIT Program Director: William R. Lynn, BS.\*

• *Division of Cancer Prevention and Control; Biometry Branch (Bethesda, Md).* Acting Chief: Laurence S. Freedman, MA\*.\*; Lead Research Investigator: Sylvan B. Green, MD\*.\*; Computer Systems Analyst: Donald R. Shopland, MS\*.\*; Mathematical Statisticians: Barry Graubard, PhD, Stuart Baker, PhD.

• *Division of Cancer Prevention and Control; Prevention and Control Extramural Research Branch (Bethesda, Md).* Acting Chief: Sherry L. Hills, MD, MPH; Public Health Advisor: Daria A. Chapelsky, MS.

• *Division of Cancer Etiology; Biostatistics Branch (Bethesda, Md).* Head, Epidemiologic Methods Section: Mitchell Gail, MD, PhD\*.\*; Medical Statistician: Steven Mark, MD, ScD.

## Chair, Steering Committee

Erwin Pettigrew, MA, PhD, Michigan State University.

## Research Institutions

• *American Health Foundation (New York, NY).* Community pairs: Yonkers (I), New Rochelle (C). Principal Investigator: Mario A. Orlandi, PhD, MPH; Co-Principal Investigator: Alfred McAlister, PhD; Co-Investigators: Jacqueline Royce, PhD; Eugene Lewit, PhD; Project Director: Lisa T. Dalton, BA; Field Director: Avril Dawkins, BA; Community Analyst: Bonnie Buchanan, BS.

• *Fred Hutchinson Cancer Research Center (Seattle, Wash).* Bellingham (I), Longview/Kelso (C). Principal Investigator: Beti Thompson, PhD; Co-Investigator: Margaret A. Hargreaves, MD, DrPH; Deborah Bowen, PhD; Community Analyst: K. Mark Leek, MA; Field Director: Juliette Thompson, BA.

• *Kaiser Permanente Medical Care Program, Northern California Region, Division of Research (Oakland, Calif).* Vallejo (I), Hayward (C). Principal Investigator: Lawrence Wallack, PhD; Co-Investigator: Kitty Corbett, PhD; Project Director: Robert McGonaghan, MPH; Field Director: Sandra Tosti; Field Director (until 1/90): Joan Bennett, MA.

• *Lovelace Institutes (Albuquerque, NM).* Santa Fe (I), Las Cruces (C). Principal Investigator: Neill F. Piland, DrPH; Project Director: Lawrence R. Hargreaves, MD, MPH; Community Analyst: Annette M. Phillipp, MPH; Field Director: Aile Shebar, RN.

• *Oregon Research Institute (Eugene, Ore).* Medford/Ashland (I), Albany/Corvallis (C). Principal Investigator: Edward Lichtenstein, PhD\*.\*; Co-Principal Investigator: Russell E. Glasgow, PhD; Project Coordinator: Linda Rettekoven, MA; Field Director: Carolyn Johnson, BS; Community Analyst: Shari Reyna, MA.

• *Research Triangle Institute (Research Triangle Park, NC).* Raleigh (I), Greensboro (C). Principal Investigator: Tyler D. Hartwell, PhD\*.\*; Co-Principal Investigator: Robert H. Shipley, PhD; Project Director: David A. Martin, MS, MPH; Project Director (until 9/89):

Elizabeth T. Walker, BS; Field Director: Lea Stanley, MPH; Community Analyst: Bonnie Veaner, MPH; Community Organizer: Carol Stephenson, BS.

• *Roswell Park Cancer Institute (Buffalo, NY).* Utica (I), Binghamton/Johnson City (C). Principal Investigator: K. Michael Cummings, PhD, MPH\*.\*; Co-Principal Investigator: Terry F. Pechacek, PhD; Project Director: Russell C. Sciandra, MA; Community Analyst: Eva Anderson Sciandra, BS; Field Directors: Janine Sadlik, BS, Sharon Ann Rankins-Burd.

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# Predictors of smoking cessation in a cohort of adult smokers followed for five years

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EXHIBIT NO. 3  
12-13-99  
GINA GLANTZ

## Abstract

**Objective**—To identify variables predictive of smoking cessation in a cohort of cigarette smokers followed for five years.

**Design**—Data analysed in this paper come from a cohort tracking telephone survey of 13 415 cigarette smokers aged 25–64 years from 20 American and two Canadian communities who were interviewed in 1988 and re-interviewed in 1993 as part of the National Cancer Institute's Community Intervention Trial for Smoking Cessation. Predictors of smoking cessation evaluated in this study included measures of past and current smoking behaviour, past quit attempts, stated desire to stop smoking, and demographic characteristics.

**Outcome measures**—Smoking cessation was based on self report. A "quitter" was defined as a cohort member who, at the final annual contact in 1993, reported not smoking any cigarettes for the preceding six months or longer. Any smoker who reported having made a serious quit attempt between 1988 and 1993 was asked to indicate reasons that contributed to their decision to try to stop smoking.

**Results**—67% of smokers reported making at least one serious attempt to stop smoking between 1988 and 1993 and, of these, 11% were classified as having quit smoking in 1993. The most common reasons given for quitting smoking were concern over health (91%), expense (60%), concern about exposing others to second-hand smoke (56%), and wanting to set a good example for others (55%). Statistically significant predictors of smoking cessation included male gender, older age, higher income, less frequent alcohol intake, lower levels of daily cigarette consumption, longer time to first cigarette in the morning, the use of premium cigarettes, initiation of smoking after age 30, history of past quit attempts, a strong desire to stop smoking, and the absence of other smokers in the household. Predictor variations with the largest relative risks for smoking cessation were those associated with nicotine dependence such as amount smoked daily and time to first cigarette in the morning.

**Conclusions**—Despite the fact that most smokers expressed a strong desire to stop smoking in 1988, the majority, especially the most dependent heavy smokers (>25

cigarettes/day), struggled unsuccessfully to achieve this goal.

(Tobacco Control 1997;6 (suppl 2):S57-S62)

**Keywords:** smoking cessation predictors

## Introduction

Cigarettes cause more illness and death in the United States than anything else. It is well accepted that nicotine in cigarettes contributes to the struggle that many smokers experience in stopping smoking. "Despite attempts by the cigarette industry to frame the debate on smoking as the right of each person to choose to smoke or not smoke, the facts speak differently. Surveys show that 70% of smokers wish they could quit"; for every smoker who does quit, nine try and fail; and studies have repeatedly shown that the more dependent a person is on nicotine, the more difficulty they have in quitting." For example, in a recent study examining predictors of quitting in a cohort of California smokers followed for two years, Farkas *et al* found that measures of nicotine dependence were stronger predictors of quitting than measures of motivation and readiness to stop smoking.

Recent studies have identified a number of variables associated with success in quitting smoking. "Among these are: smoking fewer cigarettes daily, past quit attempts, higher socioeconomic level, and older age." Female gender, African American race, and recent use of alcohol, on the other hand, have been associated with a lower likelihood of quitting." The COMMIT study, which tracked the smoking habits of a cohort of smokers over a five-year period, provides a unique opportunity to investigate individual-level predictors of smoking cessation. The following questions were used to guide analyses of data.

- What percentage of smokers express a desire to stop smoking? How many of these actually attempt to quit, and of these how many succeed?
- What are the most common reasons smokers give for quitting smoking? Do the reasons given for quitting smoking differ between those who do or do not succeed in quitting?
- What characteristics of smokers are predictive of success in stopping smoking?

The findings from this study should contribute to our understanding of factors underlying smoking cessation and thus aid in the development of public health interventions to assist smokers in stopping smoking.

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## Methods

### COMMIT STUDY

The data analysed in this paper come from a longitudinal study involving 13 415 cigarette smokers from 20 American and two Canadian communities who were interviewed in 1988 and re-interviewed in 1993 as part of the National Cancer Institute's Community Intervention Trial for Smoking Cessation (COMMIT) study. The design and primary outcomes have been described previously.<sup>1</sup>

### DATA COLLECTION

From January to May 1988, a telephone survey was conducted to identify cohorts of approximately 915 current cigarette smokers aged 25-64 years in each of the 22 study communities (see reference 17 for a list of the 22 COMMIT study communities). The survey was conducted generally using a modified, random-digit dialling technique and community-specific geographic screening to identify households within the targeted areas. Most of the questions which made up the survey were from earlier national surveys of smoking behaviour such as the 1986 Adult Use of Tobacco Survey and the 1987 National Health Interview Survey.<sup>20-21</sup> The survey was implemented in two stages. The first stage involved identifying representative samples averaging 4000 households within each community and gathering information on the age, gender, and smoking habits of all adults within selected households. (This stage is referred to as the rostering stage.) In the second stage, a sample of current smokers aged 25-64 years was selected for an extended interview which included questions about current and past smoking habits, brand and type of cigarette usually smoked, interest in quitting smoking, alcohol consumption, the presence of other smokers in the household, and sociodemographic characteristics. For the purposes of this study, current smokers were defined as those who, in 1988, reported having smoked at least 100 cigarettes in their lifetime and who reported smoking at the time of interview.

The mean response rate for the household rostering portion of the survey was 83.7%. Of the eligible smokers identified for the household rostering, 91.5% completed the extended interview. The initial cohort identification survey gathered data on a total of 20 272 current smokers aged 25-64 years who were then followed prospectively until 1993.

Between 1988 and 1992, cohort participants were contacted once per year either by telephone or mail to assess their current smoking status and residency. To ensure that the cohorts remained as representative as possible of their communities, telephone contact with cohort members was kept to a minimum. Thus, although it may have been valuable to question cohort members about their smoking habits during the interim years, such questions were not permitted. However, between January and May 1993 cohort members were asked to respond to a 20-minute telephone interview which included questions about current smok-

ing status, efforts made to stop smoking since 1988, and reasons given for attempting to stop smoking.

Overall, 66.2% of cohort members ( $n = 13 415$ ) provided information on their smoking status at the final contact in 1993. Most of the cohort members who were classified as non-responders were those who could not be located (29.9%,  $n = 6052$ ), were deceased (2.4%,  $n = 492$ ), or refused to participate in the follow-up survey (1.5%,  $n = 313$ ). Compared with responders to the 1993 follow-up survey, non-responders tended to be younger, single, and had fewer years of formal education.

### OUTCOME MEASURES

Smoking cessation was based on self report. A "quitter" was defined as a cohort member who, at the final annual contact in 1993, reported not smoking any cigarettes for the preceding six months or longer. Cohort participants who had quit smoking and those who were still smoking but who reported having made a serious attempt to stop smoking between 1988 and 1993 were asked to indicate whether any of the following reasons were important to them when they last tried to stop smoking: the expense of smoking; concern for current or future health; concern about the effects of passive smoking on others; pressure from family members, friends, and co-workers; restrictions on smoking at work; advice from a health professional; concern about bad breath, bad taste, smell from cigarette smoke; the desire to set a good example for children; and the death of a friend or relative. For each reason, respondents answered "yes" or "no". Thus, it was possible for respondents to mention more than one reason for attempting to stop smoking.

### ANALYSIS METHODS

Estimates of the percentage of smokers who attempted to stop smoking between 1988 and 1993, reasons for attempting to stop smoking, and the percentage who were successful in quitting were computed for all cohort members combined and separately for each of the 22 communities in the study. However, only the combined data are presented here, as the focus is on individual-level predictors of smoking cessation. The effect of the COMMIT intervention on the quit rates among cohort members has been described elsewhere.<sup>1</sup> Briefly, the effect of the COMMIT intervention on the quit rate of cohort members was small (an overall average increased quit rate of 1.8%), although statistically significant with a probability value of less than 0.05. To take account of this effect, the relationship between individual-level predictors of smoking cessation are adjusted for the effects of the COMMIT intervention.

Logistic regression analysis was used to assess the association between smoker characteristics measured in 1988 and smoking cessation measured in 1993. Smoker characteristics evaluated in relation to smoking cessation included:

- Age (25-34, 35-44, 45-54, 55-64 years)

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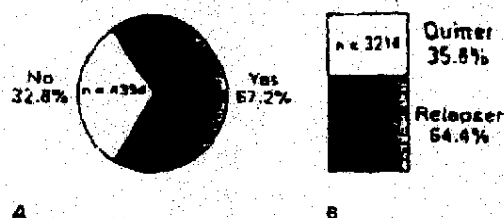


Figure 1 (A) Reported quit attempts and (B) smoking cessation among those who made a serious attempt to quit in a cohort of 13 413 smokers followed between 1988 and 1993

- Gender
- Race/ethnicity (white, black, Hispanic, Asian, American Indian, Canadian, other)
- Average annual household income (<US\$10 000, \$10 000–\$25 000, \$25 001–\$40 000, >\$40 000)
- Time in formal education (<12, 12, 13–15, >15 years)
- Frequency of alcohol consumption (daily, 3–4 times/week, 1–2 times/week, 1–3 times/month, <1 time/month)
- Cigarettes smoked daily (<5, 5–14, 15–24, >25)
- Time to first cigarette in the morning (<10, 10–30, 31–60, >60 minutes)
- Age began smoking (<16, 16–19, >19 years)
- Usual type of cigarette consumed (premium, discount, or generic brand)
- Use of non-cigarette tobacco products (none vs pipe tobacco, cigars, chew or snuff tobacco)
- History of past quit attempts (none, one attempt, more than one attempt)
- Desire to quit smoking (not at all, a little, somewhat, a lot)
- Presence of another smoker in the household

#### Results

##### QUIT ATTEMPTS AND QUIT RATE

As figure 1 shows, 67.2% of smokers reported having made at least one serious attempt to stop smoking between 1988 and 1993, and of these 32.8% were classified as quitters in 1993. In 1988, when asked the question: "How much do you want to quit smoking?", 67.6% of smokers answered "quite a bit", "somewhat" or "a lot". Among these individuals, 24.6% were classified as quitters in 1993.

##### REASONS FOR QUITTING

Table 1 shows the reasons given for attempting to quit smoking among cohort members who had quit smoking and those who were still

smoking but who reported having made at least one attempt to stop smoking between 1988 and 1993. The most common reasons given for quitting smoking were concern over health (91%), expense (60%), concern about exposing others to secondhand smoke (56%), and wanting to set a good example for others (55%). The rank ordering of different reasons given for stopping smoking was similar between those who quit smoking and those who continued to smoke. However, with the exception of concern over health, endorsed by 90% of continuing smokers as well as quitters, those who continued to smoke were significantly more likely to endorse additional reasons for quitting compared with those who succeeded in stopping smoking.

##### PREDICTORS OF QUITTING

Table 2 shows the results of the logistic regression analysis relating smoker characteristics measured in 1988 and smoking cessation measured in 1993. Significant predictors of smoking cessation included male gender, older age, higher income, less frequent alcohol intake, lower levels of daily cigarette consumption, longer time to first cigarette in the morning, the use of premium cigarettes, initiation of smoking after age 20, more than one previous quit attempt, a strong desire to stop smoking, and the absence of other smokers in the household.

Of the various smoker characteristics evaluated, indicators of nicotine dependence, such as amount smoked daily and time to first cigarette of the day, were most strongly correlated with smoking cessation. Figure 2 shows the relationship between the amount smoked daily in 1988 and the likelihood of being classified as a quitter in 1993. A similar relationship is seen when other measures of nicotine dependence are substituted for amount smoked daily. In a simple linear regression analysis where all of the predictor variables measured in this study are included in the model (data not presented), measures of nicotine dependence account for 10 times the variance in smoking cessation than indicators of motivation to stop smoking, such as past quit attempts and expressed desire to quit.

##### Discussion

The data come from one of the largest community intervention studies ever undertaken to track the smoking habits of a non-clinic based group of smokers over an

Table 1 Reasons for quitting among those who made a serious quit attempt between 1988 and 1993

Reason	Continuing smokers (n = 3807) (%)	Successful quitters (n = 3214) (%)	Total (n = 7021) (%)
Concern for current or future health	90.2	90.2	90.2
Expense associated with smoking*	64.4	52.8	60.7
Concern for the effect of ETS on others*	57.4	52.2	55.8
Setting a good example*	56.1	52.4	55.1
Bad breath, smell, or taste*	49.5	42.8	47.3
Pressure from family, friends, or co-workers*	46.7	37.3	43.7
Advice from doctor or dentist*	44.0	33.7	40.7
Illness or death of a friend or relative*	22.3	17.8	20.9
Smoking restrictions at work*	22.2	14.4	19.7

\* $P < 0.05$  for  $\chi^2$  test of independence

ETS = environmental tobacco smoke

BEST IMAGE

extended period of time. The results of this study are consistent with the larger body of clinic-based research on smoking cessation, which shows that success in stopping smoking is determined by the interplay of multiple factors, including combinations of psychological, physiological, and social processes.

With few exceptions, the variables found to influence smoking cessation among smokers tracked as part of the COMMIT study are the same ones that have been found to be associated with cessation in clinical studies.<sup>14-16</sup> For example, men were somewhat more successful than women at stopping smoking, and older smokers were more

successful than younger ones. Race/ethnicity and education did not emerge as significant predictors when the data were subjected to multivariate analysis, although annual household income was positively associated with quitting. Frequency of alcohol consumption and use of generic cigarettes were inversely related to stopping smoking. Our findings reinforce the predominant view held by medical experts today, which is that maintenance of smoking behaviour in adults is strongly controlled by addiction to nicotine.<sup>17</sup> By far, the most robust predictors of smoking cessation among cohort participants were measures thought to be indicative of strength

Table 2 Results of logistic regression analysis relating smoker characteristics measured in 1986 and smoking cessation measured in 1993\* (n = 15 415)

Characteristic	Sample size	Per cent quit	Relative risk	95% CI
Sex				
Male	6599	24.0	1.00	Referent
Female	6816	23.0	0.85	0.78-0.94
Age (years)				
25-34	4249	22.8	1.00	Referent
35-44	4349	22.0	0.90	0.86-1.11
45-54	2817	24.0	1.21	1.06-1.37
55-64	2100	29.3	1.57	1.37-1.81
Race				
White	10 972	23.3	1.00	Referent
Black	962	27.7	0.96	0.82-1.17
Hispanic	657	30.0	1.05	0.87-1.26
Canadian	1449	23.1	0.96	0.81-1.13
Asian	136	28.3	0.90	0.59-1.37
American Indian	117	20.5	0.88	0.55-1.43
Other	42	33.3	1.49	0.73-3.02
Annual household income (US\$)				
< 1000	1139	20.5	1.00	Referent
10 000-25 000	3730	22.2	1.13	0.96-1.36
25 001-40 000	4087	24.1	1.34	1.12-1.61
> 40 000	5456	26.0	1.47	1.22-1.77
Education (years)				
< 12	2526	22.4	1.00	Referent
12	3257	23.6	1.03	0.89-1.19
13-15	5367	23.5	1.00	0.87-1.15
> 16	2297	24.9	1.04	0.89-1.23
Frequency of alcohol consumption				
Daily	1572	20.9	1.00	Referent
3-4 times/week	1240	21.0	0.96	0.86-1.19
1-2 times/week	3064	23.4	1.09	0.95-1.29
1-3 times/month	2299	24.6	1.24	1.04-1.47
< 1 month or never	5100	25.6	1.35	1.16-1.57
Cigarettes smoked per day in 1986				
< 25	5569	18.7	1.00	Referent
25-34	4783	22.7	1.15	1.03-1.28
35-44	2356	32.4	1.59	1.36-1.83
> 45	695	46.0	2.38	1.92-2.96
Age started smoking (years)				
< 15	3225	21.1	1.00	Referent
16-19	6606	22.1	1.03	0.92-1.14
> 20	3584	28.1	1.36	1.01-1.82
Time to first cigarette (minutes)				
< 10	4239	17.9	1.00	Referent
10-30	3960	21.1	1.16	1.05-1.33
31-60	2431	28.2	1.41	1.25-1.62
> 61	1640	35.9	1.84	1.59-2.14
Use non-cigarette product				
No	13 003	24.0	1.00	Referent
Yes	406	24.3	0.86	0.66-1.12
Type of cigarette				
Premium	12 078	24.4	1.00	Referent
Discount	606	18.6	0.75	0.66-1.06
Generic	173	15.0	0.64	0.41-0.90
Quit attempt				
0	6255	22.0	1.00	Referent
1	2427	24.4	1.07	0.97-1.21
> 2	2717	27.7	1.14	1.01-1.29
Draw to quit				
Not at all	2200	22.2	1.00	Referent
A little	2116	22.9	1.20	1.07-1.40
Somewhat	4216	22.9	1.11	0.96-1.31
A lot	4862	26.0	1.24	1.07-1.42
Number of other household smokers				
0	7216	25.5	1.00	Referent
> 1	6200	22.1	0.87	0.78-0.95

\*Adjusted for COMMIT intervention status.  
CI = confidence interval.

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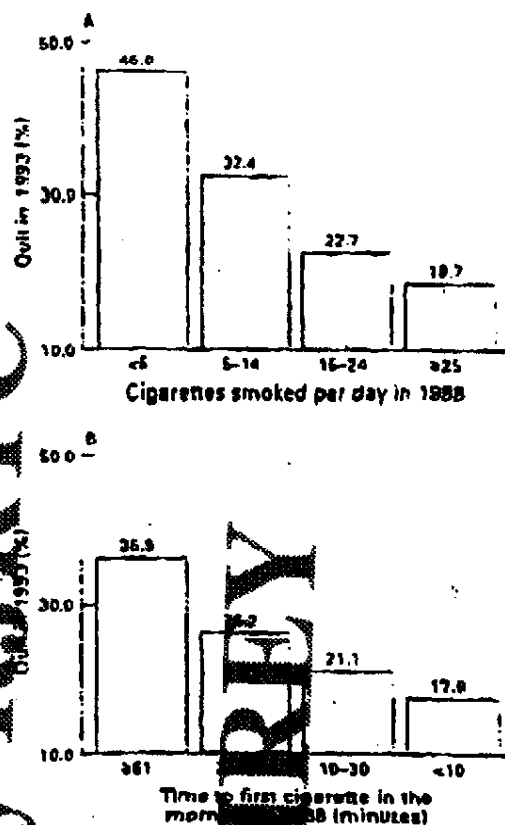


Figure 2 Relationship between measures of strength of nicotine dependence as measured in 1988 (amount smoked and time to first cigarette in the morning) and smoking cessation in 1993.

of nicotine dependence (amount smoked daily, time to first cigarette of the day).

The criteria used to define whether or not a person is addicted to a substance vary, but common to most definitions is the concept of compulsive use, even when faced with knowledge that the substance is harmful.<sup>1</sup> The results of this study support the idea that a large percentage of smokers are addicted to cigarettes. For example, a third of smokers enrolled in COMBAT in 1988 reported having made an unsuccessful attempt to stop smoking in the previous year between 1988 and 1993, 67% of smokers reported making at least one serious effort to stop smoking between 1988 and 1993, yet only a third of those who attempted to stop smoking were classified as not smoking in 1993. Unfortunately, information about reasons for relapsing was not collected. Most smokers believe that smoking is harmful and that quitting smoking would improve their health.<sup>2</sup> Among smokers who reported making a quit attempt, nearly all mentioned health concerns as an important factor motivating their decision to quit. This result is similar to findings presented by Gilpin *et al* who found that concern about their health was the most important reason smokers gave for stopping smoking.<sup>3</sup> In 1988, two-thirds of smokers expressed either a strong or moderate desire to stop smoking, yet only 24% were not smoking when re-interviewed in 1993. Taken together, these results indicate that most adult smokers are motivated to stop smoking, but are

unable to do so easily, especially those who smoke more frequently.

On a practical level, the findings from this research have both public policy and treatment implications. From a public policy perspective, our data support the view that for many smokers, smoking is not a volitional behaviour, but an addiction.<sup>4</sup> Nicotine is believed to be the chemical in tobacco smoke which explains why people continue to use tobacco products.<sup>5</sup> The concept of smoking as an addiction offers a number of interesting, although little used, policy options including: (a) regulation of nicotine-containing cigarettes<sup>6</sup>; (b) the use of cigarette taxes to fund low-cost or free smoking cessation treatment programmes for smokers<sup>7</sup>; (c) tort damage claims by smokers against cigarette manufacturers<sup>8</sup>; and (d) policies protecting smokers from discrimination in employment.<sup>9</sup>

From a treatment perspective, the findings from this study highlight the importance of helping smokers, especially heavier smokers, overcome their need for nicotine. The means to achieve this therapeutic goal could take many forms including, but not limited to, the use of nicotine replacement products, gradual reduction of the number of cigarettes smoked daily, and having smokers switch to cigarettes with less nicotine. Recent practice guidelines on smoking cessation issued by the Agency for Health Care Policy and Research emphasised the need to make support services more accessible to smokers.<sup>10</sup> Heavy smokers are more likely to seek out assistance in quitting smoking, and evidence shows that a dose-response relation exists between the intensity and duration of treatment and its effectiveness.<sup>11</sup> Unfortunately, the reality in most healthcare and other settings today is that providers are unable to adequately address the needs of smokers who are highly dependent on nicotine.

Support for this research has been provided by the National Cancer Institute and the Robert Wood Johnson Foundation. We are indebted to our colleagues at the 1) COMBAT research site, the COMBAT coordinating center, Information Management Services, Inc., and staff at the National Cancer Institute who planned and coordinated the massive data collection services of the COMBAT study.

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- 28 Denstein NL, Humphreys JE. Establishing a nicotine threshold for addiction. *N Engl J Med* 1994;331:123-5.
- 29 Humphreys JE. Introduction to tobacco harm reduction as a complementary strategy to smoking cessation. *Tobacco Control* 1995;4(suppl 2):S23-33.
- 30 Warner KE, Slade J, Berman DT. The emerging market for long-term nicotine substitutes. *JAMA* 1997;278:1067-82.
- 31 Rabin RL, Sugarman SD. *Overview*. In: Rabin RL, Sugarman SD, eds. *Smoking policy: law, politics and culture*. New York: Oxford University Press, 1993:9-13.
- 32 Fiore MC, Boffa WC, Cohen SJ, et al. *Smoking cessation: Clinical Practice Guideline No 18*. Rockville, Maryland: US Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, April 1996. (AHCPR Publication No 96-0692).
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Wecker  
EXHIBIT NO. 5  
12-13-00  
GINA GLANTZ

52614 0756

produced by : `quietRateRatio.sas` p15

```

. use "JZY HD:JZY Work:Rjrfalisse:commit:data:commit", replace
. gen yrborn=1947-age87
. gen yrAge17=yrborn+17
. gen yrBegin=1987
. gen yrEnd=yrborn+ageend
. gen quit=status93==1
. gen w=1
. gen double ID = camcode*1e6 + seq_id*10 + member
. format ID %12.0g
.
. * Compare Survival Curves by age for entire observation period
. stset yrBegin failure(quit) origin (time yrAge17) enter(yrBegin) scale(1)
> id(ID)
(frequency weights assumed)

```

```

      failure = 0; ID
      quit -- 0 & quit --
obs. time = 0; [yrEnd(n-1), yrEnd]
enter on or after time yrBegin
exit on or before failure
t for [time-origin;
      origin; time yrAge1?
      weight; {weightsw}]

```

13415	total obs.	
0	missings	

13415	physical obs. remaining, equal		
13415	weighted obs., representing		
13415	subjects		
3214	failure in single failure-per-		
72616	total analysis time at risk, at risk from t =		0
	earliest observed event t =		7
	last observed event t =		52

```

. * keep male only
. keep if sex==1
16816 observations deleted!

```

```

sts generate = s. by(commit)
sts generate quit = h. by(commit)

```

- \* Cox proportional hazards comparison of rates
- steox comm

```

fail:quit
analysis time _b_ (yrEnd-origin)
time yrAqel7
enter on or after time yrBegin
ID
weightaw

```

```
Iteration 0: log likelihood = -10724.696
Iteration 1: log likelihood = -10724.393
Iteration 2: log likelihood = -10724.393
Refining estimates
Iteration 0: log likelihood = -10724.393
```

Cox regression Breslow method for ties

No. of subjects	6599	Number of obs	6599
No. of failures	1582		
Time at risk	35724		
Log likelihood	-10724.293	LR chi2(1)	0.61
		Prob > chi2	0.425

d	Max Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
commit	1.046694	0.051692	2.0249	0.0436	[0.942647, 1.146742]

[illegible]

```

        failure_id      put
        analysis time to  failure origin
        origin          time yrbeg1
enter in 11 after      time yrbeg1

```

H Proportional Buyer model  
(Last gets H 2nd)  
see pp 47, P2

**BEST IMAGE**

W1113, p. 4 fn 14

4/14

Comm = 1.5% interest  
in investment

*U. d. d. 1987*

Harry Cobb  
nqr3s\_commit.log

BEST COPY

id: ID  
weight: [fweight=w]  
Iteration 0: log likelihood = -9288.2255  
Iteration 1: log likelihood = -9188.7537  
Iteration 2: log likelihood = -9183.0182  
Iteration 3: log likelihood = -9182.9898  
Iteration 4: log likelihood = -9182.9898  
Refining estimates:  
Iteration 0: log likelihood = -9182.9898

Cox regression -- Breslow method for ties

No. of subjects = 5841  
No. of failures = 1395  
Time at risk = 31619  
Number of obs = 5841  
LR chi2(40) = 210.47  
Prob > chi2 = 0.0000  
Log likelihood = -9182.9898

	haz. ratio	Std. Err.	z	P> z	(95% Conf. Interval)
commit	1.018284	.0550171	0.334	0.738	.9158859 1.131952
_age1	1.061107	.1061107	-2.476	0.013	.8500328 1.3225099
_age2	.3965642	.0940849	-3.898	0.000	.2490955 .6323267
_age3	.3764147	.1128454	-3.259	0.001	.209163 .6774048
_race1	.465276	.0986005	-1.428	0.153	.2739954 1.063866
_race2	.1101227	.0163	0.872		.8210676 1.257985
_race3	.0996657	.0016	-0.016		.8210045 1.214184
_race4	.1817894	.0862	-0.862		.5367244 1.271623
_race5	.270251	.0113	-0.113	0.890	.554736 1.668439
_race6	.5299805	.0614	0.539		.5746022 2.884911
_inc1	.1471876	.0897	0.897		.8701457 1.453459
_inc2	.1568392	.1365	1.365		.9222989 1.54392
_inc3	.1830076	.2322	0.232		1.050015 1.77567
_educ1	.0910054	.0061	-0.061		.8445392 1.201138
_educ2	.0821096	.0056	-0.560	0.576	.804855 1.128251
_educ3	.1065712	.0208	0.208		.832193 1.252864
_dic1	.106635	.0018	0.018		.8125402 1.233584
_dic2	.102031	.0981352	1.081		.9255199 1.312159
_dic3	.119742	.177272	1.83		.9875493 1.451893
_dic4	.1294526	.110317	1.029	0.002	1.095401 1.529449
_amt1	.0750965	.196	1.96		1.000519 1.295811
_amt2	.127461	.381	3.81		1.183924 1.686169
_amt3	.226203	.4580	4.580	0.000	1.393561 2.289393
_strtl	.072023	.088	0.88		.9298345 1.213193
_strt2	.089887	.146	1.46		.9615012 1.335691
_frst1	.0733	.0069	0.069	0.929	.8677657 1.167997
_frst2	.1078619	.322	3.22	0.001	1.110157 1.534422
_frst3	.1538543	.4767	4.767	0.000	1.285872 1.840864
_none	.1087333	.091	0.91		.7010361 1.123309
_preml	.1210069	.1215	1.215	0.223	.62694 1.115923
_preml	.1847987	.14	1.4		.3803091 1.141738
_quit1	.0817248	.14	1.4		.9651603 1.18662
_quit2	.0912958	.2542	2.542		1.044856 1.404033
_want1	.0938855	.0404	-0.404		.7938803 1.16416
_want2	.0834613	.033	-0.33		.82211 1.150817
_want3	.0874053	.008	0.008		.8461123 1.190401
_nums	.0491493	.2227	2.227	0.026	.7922141 .9852577
_white	.0773658	.038	0.38		.8924634 1.180993
_pink	.0799563	.0508	0.508	0.613	.8943753 1.208986
_none	.1344187	.1138	1.138		.606191 1.141952

\* Complete without restrictions on common parameters  
\* strag if comr=30, dist(gompertz)

fail: 0 quit  
analysis time: (yrEnd-origi)  
time yrAge17  
enter on or after: time yrBegin  
id: ID  
weight: [fweight=w]

Iteration 0: log likelihood = -15144.178  
Iteration 1: log likelihood = -746.5351  
Iteration 2: log likelihood = -672.319  
Iteration 3: log likelihood = -671.61643  
Iteration 4: log likelihood = -671.61605  
Iteration 5: log likelihood = -671.61605

Gompertz regression -- log relative-hazard form

No. of subjects = 1247  
No. of failures = 76  
Time at risk = 17611  
Number of obs = 1247  
Wald chi2 0 =  
Prob > chi2 =

	haz. ratio	Std. Err.	z	P> z	(95% Conf. Interval)
gender	.166353	.122407	1.353	0.177	.0168417 1.449

\* predict glist if commit = 1, haz

Make, not assume P1,2 var  
or cov  
H model from P1  
using like cov in T dde  
using 7A cov in T dde  
T, P1,2

100% paper use  
Page w/ page use

BEST IMAGE

Gompertz calc 1 p4 curves

52614 0758

# nqr3s\_commit.log

(3352 missing values generated)

```
. streg if commit==1, dist(gompertz)
```

```
      failure _d: quit
      analysis time _t: /yrEnd-origini
      origin: time yrAge17
      enter on or after: time yrBegin
      id: ID
      weight: [fweight=w]
```

```
Iteration 0: log likelihood = -15459.203
Iteration 1: log likelihood = -762.91182
Iteration 2: log likelihood = -696.94462
Iteration 3: log likelihood = -696.35653
Iteration 4: log likelihood = -696.35618
Iteration 5: log likelihood = -696.35618
```

Gompertz regression -- log relative-hazard form

```
No. of subjects = 3352      Number of obs = 3352
No. of failures = 815
Time at risk = 18093
Log likelihood = -696.35618      Wald chi2(1) =
      Prob > chi2 =
```

	_t	coefficient	Std. Err.	z	P> z	[95% Conf. Interval]
gamma		.015782	.0032765	4.81	0.000	.0093602 .0222038

```
. predict qQuit1 if commit == 1, haz
(3247 missing values generated)
```

```
. replace qQuit1 = qQuit1 if commit == 1
(3352 real changes made)
```

```
. gen int Age = _t + 17
```

```
. sort commit Age
```

```
. drop if Age == Age[_n-1]
(6509 observations deleted)
```

```
. keep Quit Surv Age
```

```
. reshape wide Quit Surv qQuit1 (i=Age) j(c)
(note: j = 0 1)
```

```
Data      long
Number of obs      90 -> 15
Number of variables 5 -> 7
j variable (2)      commit (dropped)
xij variables
      Quit      Surv      qQuit1
      Surv      Surv0 Surv1
      qQuit      qQuit0 qQuit1
```

```
. lab var Surv "Survival"
```

```
. lab var Surv0 "Survival"
```

```
. lab var Surv1 "Survival"
```

```
. lab var qQuit0 "Quit"
```

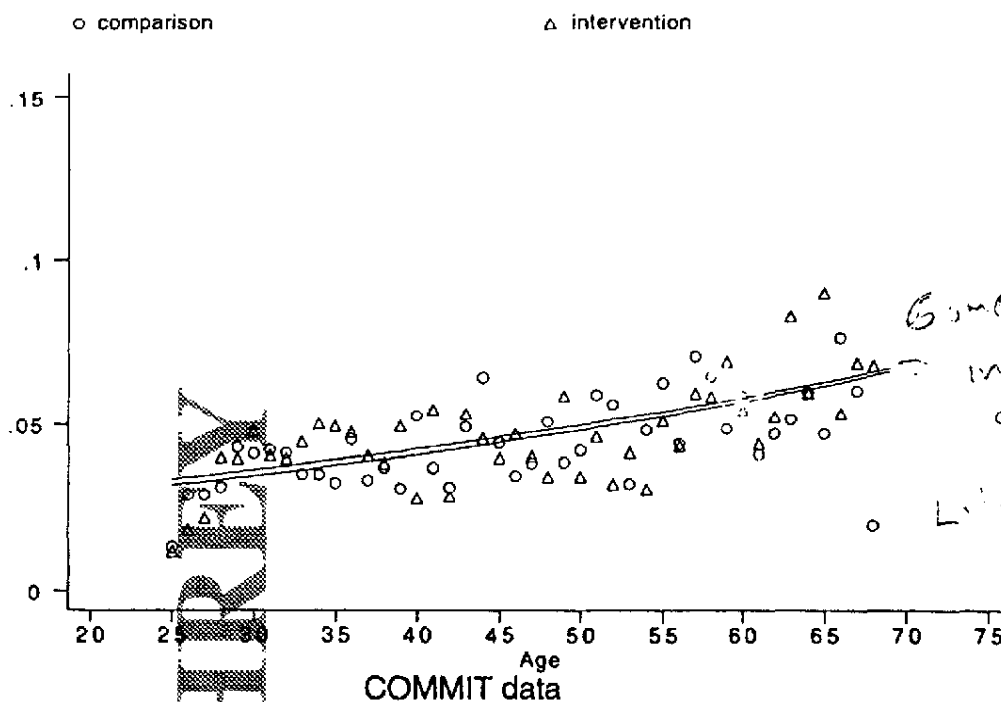
```
. lab var qQuit1 "Quit"
```

```
. lab var qQuit01 "Quit"
```

```
. gr Quit* qQuit0 Age if Age<75, c(11) s(OT) xlab(20.25.30.35.40.45.50.55.60)
> .65.70.75) ylab(0 .05 .1 .15) /
> * 11) saving 'nqr3s_commit.replace'
```

```
. log close
```

BEST  
COPY



STATA

BEST IMAGE

52614 0760



## quitRateRatio.sas

```

do _race1=0; _race2=0; _race3=0; _race4=0; _race5=1; _race6=0; end;
when(5);

do _race1=0; _race2=0; _race3=0; _race4=0; _race5=0; _race6=1; end;
when(6);

do _race1=0; _race2=0; _race3=1; _race4=0; _race5=0; _race6=0; end;
when(7);

do _race1=0; _race2=1; _race3=0; _race4=0; _race5=0; _race6=0; end;
otherwise;
end;
select (grossinc);
when(1) do; _inc1=0; _inc2=0; _inc3=0; end;
when(2) do; _inc1=1; _inc2=0; _inc3=0; end;
when(3) do; _inc1=0; _inc2=1; _inc3=0; end;
when(4) do; _inc1=0; _inc2=0; _inc3=1; end;
otherwise;
end;
select (educ);
when(1) do; _educ1=0; _educ2=0; _educ3=0; end;
when(2) do; _educ1=1; _educ2=0; _educ3=0; end;
when(3) do; _educ1=0; _educ2=1; _educ3=0; end;
when(4) do; _educ1=0; _educ2=0; _educ3=1; end;
otherwise;
end;
select (tffregale);
when(1) do; _alc1=0; _alc2=0; _alc3=0; _alc4=0; end;
when(2) do; _alc1=1; _alc2=0; _alc3=0; _alc4=0; end;
when(3) do; _alc1=0; _alc2=1; _alc3=0; _alc4=0; end;
when(4) do; _alc1=0; _alc2=0; _alc3=1; _alc4=0; end;
when(5) do; _alc1=0; _alc2=0; _alc3=0; _alc4=1; end;
otherwise;
end;
select (amt);
when(1) do; _amt1=0; _amt2=0; _amt3=0; end;
when(2) do; _amt1=1; _amt2=0; _amt3=0; end;
when(3) do; _amt1=0; _amt2=1; _amt3=0; end;
when(4) do; _amt1=0; _amt2=0; _amt3=1; end;
otherwise;
end;
select (agestr);
when(1) do; _str1=0; _str2=0; end;
when(2) do; _str1=1; _str2=0; end;
when(3) do; _str1=0; _str2=1; end;
otherwise;
end;
select (first);
when(1) do; _frst1=0; _frst2=0; _frst3=0; end;
when(2) do; _frst1=1; _frst2=0; _frst3=0; end;
when(3) do; _frst1=0; _frst2=1; _frst3=0; end;
when(4) do; _frst1=0; _frst2=0; _frst3=1; end;
otherwise;
end;
select (q48);
when(0) _none=0;
when(1) _none=1;
otherwise;
end;
select (pre);
when(0) do; _pre1=0; _pre2=0; end;
when(1) do; _pre1=1; _pre2=0; end;
when(2) do; _pre1=0; _pre2=1; end;
otherwise;
end;
select (quit);
when(0) do; _quit1=0; _quit2=0; end;
when(1) do; _quit1=1; _quit2=0; end;
when(2) do; _quit1=0; _quit2=1; end;
otherwise;
end;
select (want);
when(1) do; _want1=0; _want2=0; _want3=0; end;
when(2) do; _want1=1; _want2=0; _want3=0; end;
when(3) do; _want1=0; _want2=1; _want3=0; end;
when(4) do; _want1=0; _want2=0; _want3=1; end;
otherwise;
end;
select (num);
when(0) _num=0;
when(1) _num=1;
otherwise;
end;
select (white);
when(1) do; _white1=0; _white2=0; _white3=0; end;
when(2) do; _white1=1; _white2=0; _white3=0; end;
when(3) do; _white1=0; _white2=1; _white3=0; end;
otherwise do; _white1=0; _white2=0; _white3=1; end;
end;

```

```

run;
quit;

```

```

proc print data=quitRateRatio;

```

```

run;

```

```

proc print data=quitRateRatio;

```

```

run;

```

```

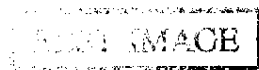
proc print data=quitRateRatio;

```

```

run;

```



52614 0762



quitRateRatio.sas

```
merge mergeForHarris (where=(ageEnd=. & status93)=1) impute (keep=comcode lyrquit);  
by comcode;  
ageEnd=age87+round(lyrquit,1)-87;  
  
data jzy.commit;  
set mergeForHarris (where=(ageEnd*=. | status93=1)) missing;
```

produced by R.JRTC  
in  
HUMPHREY

52614 0763

17

nqr7\_R2.do

```

* @MN500
* nqr7: BL-CF differences in mean smoke-years exposure
* based upon empirical smoke-survival curve and mortality
* of claimants in HRA audit files (excludes ever-smokers)
* Relative risk quitting model hC(t) = 1 + hC(t) * (1 - hC(t))
* hC(t) = R2-hB(t) if T3 > year >= T2, where T2 = T3
* hC(t) = R3-hB(t) if year >= T3, where T3 = T2
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)
* Projection to future claimants based upon birth-year distribution pi()
* derived from age9.dta and distribution of ever-smokers by birth cohort
* from nqr.dta

```

```

clear
prog drop_all
set matsize 400
set rng off
set more off

```

Load using nqr7. replace

```

* Cutoff years for changes in quit rates are global variables ST1, ST2, ST3
* Relative increase in quit rate (on or after year T1) is global variable SR1
* Relative increase in quit rate (on or after year T2) is global variable SR2
* Relative increase in quit rate (on or after year T3) is global variable SR3
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)

```

\* (1a) Get distribution of birth year of all future claimants from age9.dta

```

use age9
keep year AllFutur
mkmat year AllFutur
matrix pi = year.AllFutur
matrix drop year.AllFutur
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi
drop_all

```

\* (1b) Compute ever-smoking prevalence by birth cohort from nqr.dta

\* Note: 'nqr.dta' excludes insulator crossovers

```

drop_all
use nqr
keep coh Smok w
tab coh [w=w], sum(Smok)
matrix E = E. J(5,1,0)
matrix colnames E = t0 t1 Ever

```

\* Matrix E holds ever-smoking prevalence by cohort

```

matrix E = (1980, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971 )
matrix E = E. J(5,1,0)
matrix colnames E = t0 t1 Ever

```

```

prog def setE
local i = 1
while 'i' <= 5 {
    qui sum Smok [w=w] if coh == 'i'
    matrix E['i',3] = r(mean)
    local i = 'i' + 1
}
end
setE
matrix li E

```

\* (1c) Compute conditional distribn of birth year pi() among ever smokers

Computes Tot73, P3

```

drop_all
mat pi
* Note: In CF with pre-1988 misconduct, ever-smoking prevalence
* of 1940+ birth cohort will be reduced by 3.6% (nqr4.log),
* But this feedback effect is very small.
local i = 'i' + 1

```

HUMPHREY

getpi

```

* Replace pi_ in 2nd col of matrix pi()
mkmat pi_
matrix pi = pi(1..5m,1..1)
matrix pi = pi,pi_
end

```

\* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked

```

drop_all
* Get L and SB from nqr4 output
use nqr4
qui sum x
global xMin = r(min)
global N = _N
* LSB is proportion who are still smoking and alive
gen LSB = L*SB
qui sum LSB
* EB is mean smoke-years taking mortality into account
global EB = r(mean)*$N
di "Mean smoke-years (BL) = ", $9.2f $EB
* LSR3 = L(x)*SB(x)*R3; LSR2 = L(x)*SB(x)*R2; LSR1 = L(x)*SB(x)*R1
gen LSR1 = .
gen LSR2 = .
gen LSR3 = .
gen SC = .

```

prog def LSC

```

* $_1 = T1; $_2 = T2; $_3 = T3; $_4 = R1; $_5 = R2; $_6 = R3
global T1 = $_1
global T2 = $_2
global T3 = $_3
global R1 = $_4
global R2 = $_5
global R3 = $_6
* Check T3 > T2 > T1
if $T2 <= $T1 | $T3 <= $T2 {
    di "Invalid . $9.0f $T1,$T2,$T3
    exit
}
* Compute SB(x)*R1 and L(x)*SB(x)*R1
* Compute SB(x)*R2 and L(x)*SB(x)*R2

```

nqr7\_R2.do

```

(Compute SC1-X1, X2, and L1X1-LSB(X1))
qui replace L2SB1 = L2SB-X1
qui replace L2SB2 = L2SB-X2
qui replace L2SB3 = L2SB-X3
qui replace SC1 = 0
* Compute SC = SUM(X1, X2, L1X1-LSB(X1))
* SB(L1X1, L1, L1X1-LSB(X1))
* Sum over index j (rows of p1)
local i = 1
do while i <= nrow(p1)
  local t = p1[i,1]
  local u1 = $T1 - $XMin - 1
  local v1 = u1 - 1
  local u2 = $T2 - 1 - $XMin - 1
  local v2 = u2 - 1
  local u3 = $T3 - 1 - $XMin - 1
  local v3 = u3 - 1
  * Compute intermediate terms
  local A1 = $Q1(p1[i,1]-$T1)
  local A2 = $Q1(p1[i,1]-$T2)
  local A3 = $Q1(p1[i,1]-$T3)
  * Add terms to SC
  SC = SC + A1 + A2 + A3
  i = i + 1
end

* Compute SC1 = SC
* Lab var SC1 = SC (Rat post-2000) middle est.

LSC 1954 1963 2001 1.0 2.1 1.0
qui gen SC1 = SC
lab var SC1 = SC (Rat post-2000) middle est.

LSC 1954 1963 2001 1.5 3.6 1.0
LSC 1954 1963 2001 2.0 2.4 1.0
LSC 1954 1963 2001 2.0 3.0 1.0
LSC 1954 1963 2001 2.0 3.6 1.0
LSC 1954 1963 2001 2.0 3.9 1.0
qui gen SC_hi = SC
lab var SC_hi = SC (Rat post-2000) high est.

LSC 1954 1963 2001 2.0 3.9 3.9
LSC 1954 1963 2001 1.5 3.0 1.0
LSC 1954 1963 2001 1.5 3.0 1.0

end
rangepsc
gr SC_LSB x if x<75, ylab(0.25, 5, 75, lxlabs(25, 50, 75), l1="Proportion
Still Alive and Smoking", saving(nqr7a.replace)
gr SC_SC1 LSB x if x<75, ylab(0.25, 5, 75, lxlabs(25, 50, 75), l1="Prop
ortion Still Alive and Smoking", saving(nqr7b.replace)

form L2SB SC, W7.1f
form x 16.0f
keep x L2SB SC_
l, nod
save nqr7_R2, replace

log close
log v33\

```

BEST IMAGE

52614 0765

1L 2L 3L 4L 5L 6L 7L 8L 9L 10L 11L 12L 13L 14L 15L 16L 17L 18L 19L 20L 21L 22L 23L 24L 25L 26L 27L 28L 29L 30L 31L 32L 33L 34L 35L 36L 37L 38L 39L 40L 41L 42L 43L 44L 45L 46L 47L 48L 49L 50L 51L 52L 53L 54L 55L 56L 57L 58L 59L 60L 61L 62L 63L 64L 65L 66L 67L 68L 69L 70L 71L 72L 73L 74L 75L 76L 77L 78L 79L 80L 81L 82L 83L 84L 85L 86L 87L 88L 89L 90L 91L 92L 93L 94L 95L 96L 97L 98L 99L 100L

nqr7.log

```
* Cur-of1 years for changes in quit rates are global variables ST1, ST2, ST3
* Relative increase in quit rate (on cur-of1 year) is calculated as
* Relative increase in quit rate (on cur-of1 year) is calculated as
* Relative increase in quit rate (on cur-of1 year) is calculated as
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)
* (1a) get distribution of birth year of all future claimants from age9.dta
use "Thumper:Desktop Folder:FALSE_TASKS:Monday0508:age9"
keep year AllFutur
mkmat year AllFutur
matrix pi = year.AllFutur
matrix drop year AllFutur
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi
pi(t)
1900 .00004113
1901 .00002101
1902 .00003102
1903 .00004538
1904 .00006578
1905 .00009443
1906 .00013421
1907 .0001888
1908 .00026279
1909 .00036178
1910 .00049251
1911 .00066282
1912 .00088162
1913 .00115874
1914 .00150459
1915 .00192976
1916 .00244442
1917 .00305756
1918 .00377616
1919 .00460425
1920 .00555007
1921 .00662779
1922 .00772278
1923 .00894043
1924 .01021674
1925 .01152602
1926 .01283937
1927 .01412696
1928 .01536111
1929 .01652004
1930 .0175923
1931 .01858097
1932 .01950742
1933 .02041352
1934 .02116119
1935 .02242825
1936 .02370143
1937 .02526133
1938 .02744919
1939 .0304944
1940 .0345337
1941 .0397446
1942 .04619059
1943 .0474131
1944 .04321814
1945 .04507414
1946 .04608816
1947 .04609812
1948 .0450277
1949 .04289862
1950 .03982827
1951 .03601309
1952 .03170149
1953 .0261616
1954 .02026426
1955 .013811
1956 .00555
1957 .0117046
1958 .00837034
1959 .00611337
1960 .00435552
1961 .00303046
1962 .00206233
1963 .00137566
1964 .00090207
1965 .00058381
1966 .00037486
1967 .0002404
1968 .00015518
1969 .00010166
1970 .0000881
1971 .00017831
1972 .00017831
drop _all
* (1b) Compute ever-smoking prevalence by birth cohort from nir.dta
* Note: 'nir.dta' excludes Insulator crossovers
drop _all
use "Thumper:Desktop Folder:FALSE_TASKS:Report 6:nir"
keep coh Smok w
tab coh [w=w], sum(Smok)
(analytic weights assumed)
cohort | Mean Std. Dev. Freq. Obs.
-----+-----+-----+-----
1909 | .65828276 .47546956 846463 201
1910-19 | .78556302 .41063019 5166357 1032
1920-29 | .79826907 .40141712 11307582 1609
1930-39 | .75219631 .43200298 7859782 813
1940- | .7517905 .43243825 5989541 466
Total | .77181249 .41971504 31169725 4121
* Matrix E holds ever-smoking prevalence by cohort
```

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nqr7.log

```
matrix E = (1940, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971)
```

```
matrix E = E, J(5,1,0)
```

```
matrix colnames E = t0 t1 Ever
```

```
prog def setE
1. local i = 1
2. while 'i' <= 5 (
3.   qui sum Smok (w=w) if coh == 'i'
4.   matrix E['i',:] = r(mean)
5.   local i = 'i' + 1
6. )
7. end
```

```
setE
```

```
matrix E E
```

```
E[5,3]
t0      t1      Ever
1. 1940  1909  .65828276
2. 1910  1919  .78556302
3. 1920  1929  .79826907
4. 1930  1939  .75219631
5. 1940  1971  .7517905
```

```
prog def compute_conditional_distribn_of_birth_year_pi() among ever smokers
```

```
drop _all
```

```
sumat pi
number of observations will be reset to 72
press any key to continue, or Break to abort
OK was 0, now 72
```

```
ren pi1 t
```

```
ren pi2 pi
```

```
qui gen pi_ = .
```

```
form pi* %9.4f
```

```
prog def getpi
```

```
1. local i = 1
2. while 'i' <= 5 (
3.   replace pi_ = pi[E['i',3]] if t >= E['i',2]
4.   Note: In CF with pre-1988 misconduct, ever-smoking prevalence
of 1940+ birth cohort will be reduced by 3.6% (nir4.log).
But this feedback effect is very small.
5.   local i = 'i' + 1
6. )
7. qui sum pi_
8.   global sumpi = r(mean)*r(N)
9.   qui replace pi_ = pi_/$sumpi
10. end
```

```
if(pi>0)
real changes made(
01)
real changes made(
01)
real changes made(
```

```
(10 real changes made)
(32 real changes made)
```

produced by R4RTC

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
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matrix pi_ = pi, col = mat(pi_)
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```
matrix pi_ = pi, col = mat(pi_)
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```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
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```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

```
matrix pi_ = pi, col = mat(pi_)
```

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```

11. * Compute SB(x,T1) and L(x)*SB(x,T1)
12. * Compute SC(x,T2) and L(x)*SC(x,T2)
13. * Compute SB(x,T3) and L(x)*SB(x,T3)
14. * Compute SC(x,T3) and L(x)*SC(x,T3)
15. * Compute SC = SUM(T1,T2,T3) * SB(x,T1-T2) * (1-T1)
16. * Compute SC = SUM(T1,T2,T3) * SC * (1-T1-T2) * (1-T1)
17. * Sum over index i (rows of pi)
18. * while i <= n
19. *   local t = pi[i,1]
20. *   local t = pi[i,1]
21. *   local t = pi[i,1]
22. *   local t = pi[i,1]
23. *   local t = pi[i,1]
24. *   local t = pi[i,1]
25. *   local t = pi[i,1]
26. *   local t = pi[i,1]
27. *   local t = pi[i,1]
28. *   local t = pi[i,1]
29. *   local t = pi[i,1]
30. *   local t = pi[i,1]
31. *   local t = pi[i,1]
32. *   local t = pi[i,1]
33. *   local t = pi[i,1]
34. *   local t = pi[i,1]
35. *   local t = pi[i,1]
36. *   local t = pi[i,1]
37. *   local t = pi[i,1]
38. *   local t = pi[i,1]
39. *   local t = pi[i,1]
40. *   local t = pi[i,1]
41. *   local t = pi[i,1]
42. *   local t = pi[i,1]
43. *   local t = pi[i,1]
44. *   local t = pi[i,1]
45. *   local t = pi[i,1]
46. *   local t = pi[i,1]
47. *   local t = pi[i,1]
48. *   local t = pi[i,1]
49. *   local t = pi[i,1]
50. *   local t = pi[i,1]
51. *   local t = pi[i,1]
52. *   local t = pi[i,1]
53. *   local t = pi[i,1]
54. *   local t = pi[i,1]
55. *   local t = pi[i,1]
56. *   local t = pi[i,1]
57. *   local t = pi[i,1]
58. *   local t = pi[i,1]
59. *   local t = pi[i,1]
60. *   local t = pi[i,1]
61. *   local t = pi[i,1]
62. *   local t = pi[i,1]
63. *   local t = pi[i,1]
64. *   local t = pi[i,1]
65. *   local t = pi[i,1]
66. *   local t = pi[i,1]
67. *   local t = pi[i,1]
68. *   local t = pi[i,1]
69. *   local t = pi[i,1]
70. *   local t = pi[i,1]
71. *   local t = pi[i,1]
72. *   local t = pi[i,1]
73. *   local t = pi[i,1]
74. *   local t = pi[i,1]
75. *   local t = pi[i,1]
76. *   local t = pi[i,1]
77. *   local t = pi[i,1]
78. *   local t = pi[i,1]
79. *   local t = pi[i,1]
80. *   local t = pi[i,1]
81. *   local t = pi[i,1]
82. *   local t = pi[i,1]
83. *   local t = pi[i,1]
84. *   local t = pi[i,1]
85. *   local t = pi[i,1]
86. *   local t = pi[i,1]
87. *   local t = pi[i,1]
88. *   local t = pi[i,1]
89. *   local t = pi[i,1]
90. *   local t = pi[i,1]
91. *   local t = pi[i,1]
92. *   local t = pi[i,1]
93. *   local t = pi[i,1]
94. *   local t = pi[i,1]
95. *   local t = pi[i,1]
96. *   local t = pi[i,1]
97. *   local t = pi[i,1]
98. *   local t = pi[i,1]
99. *   local t = pi[i,1]
100. *   local t = pi[i,1]

```

```

> ,85.2f $EC,R8,JF $EB - SEC
60. end
<=9> def range = 1 to 11
def tax = 1 to 11
2. LSC 1954 1963 2001 1.0 2.1 1.0
3. qui gen SC_lo = SC
lab var SC_lo "SC (R=1 post-2000); low est."
LSC 1954 1963 2001 1.0 2.1 2.1
LSC 1954 1963 2001 1.0 2.4 1.0
LSC 1954 1963 2001 1.0 3.0 1.0
LSC 1954 1963 2001 1.0 3.6 1.0
8. LSC 1954 1963 2001 1.0 3.6 1.0
9. LSC 1954 1963 2001 1.5 3.0 1.0
10. LSC 1954 1963 2001 1.5 3.0 1.0
11. *****End Necker Change*****
qui gen SC_hi = SC
lab var SC_hi "SC (R=1 post-2000); middle est."
13. LSC 1954 1963 2001 1.5 3.0 3.0
14. qui gen SC3 = SC
15. lab var SC3 "SC (R=3 post-2000); middle est."
16. LSC 1954 1963 2001 1.5 3.6 1.0
17. LSC 1954 1963 2001 2.0 2.4 1.0
18. LSC 1954 1963 2001 2.0 3.0 1.0
19. LSC 1954 1963 2001 2.0 3.6 1.0
20. LSC 1954 1963 2001 2.0 3.9 1.0
21. qui gen SC_Hi = SC
22. lab var SC_Hi "SC (R=1 post-2000) high est."
23. LSC 1954 1963 2001 2.0 3.9 3.9
24. LSC 1954 1963 1999 1.5 3.0 1.0
25. LSC 1954 1963 2000 1.5 3.0 1.0
26.

```

rangeSC	T1	T2	T3	R1	R2	R3	X8	XC	deltax
	1954	1963	2001	1.0	2.1	1.0	45.43	37.06	9.37
	1954	1963	2001	1.0	2.1	2.1	45.43	34.47	10.96
	1954	1963	2001	1.0	2.4	1.0	45.43	35.34	10.09
	1954	1963	2001	1.0	3.0	1.0	45.43	32.42	13.01
	1954	1963	2001	1.0	3.6	1.0	45.43	30.03	15.40
	1954	1963	2001	1.5	2.4	1.0	45.43	35.12	10.31
	1954	1963	2001	1.5	2.0	1.0	45.43	45.11	0.32
	1954	1963	2001	1.5	3.0	3.0	45.43	29.53	15.90
	1954	1963	2001	1.5	3.6	1.0	45.43	29.85	15.58
	1954	1963	2001	2.0	2.4	1.0	45.43	34.90	10.52
	1954	1963	2001	2.0	3.0	1.0	45.43	32.03	13.40
	1954	1963	2001	2.0	3.6	1.0	45.43	29.68	15.75
	1954	1963	2001	2.0	3.9	1.0	45.43	28.65	16.77
	1954	1963	2001	2.0	3.9	3.9	45.43	26.30	19.13
	1954	1963	1999	1.5	3.0	1.0	45.43	32.75	12.68

remove confounder-specific  
quit rate effect  
(future)

nqr7.log

```

1954 1963 2000 1.5 3.0 1.0 45.43 32.48 12.95
gr SC_ LSB x if x<=75,ylab(0.25,5.5,xlab(0.00,0.00),title="Proportion Still Alive and Smoking",save=nqr7b,replace=
)
(Delete: file nqr7b.gph not found)
gr SC_ SC3 LSB x if x<=75,ylab(0.25,5.5,xlab(0.00,0.00),title="Proportion Still Alive and Smoking",save=nqr7b,replace=
)
(Delete: file nqr7b.gph not found)

```

form LSB SC\* v7.1f

form x %6.0f

keep x LSB SC\*

1. nod

x	LSB	SC_lo	SC_	SC_hi
1.	1.000	1.000	1.000	1.000
2.	1.000	1.000	1.000	1.000
3.	0.998	0.998	0.998	0.996
4.	0.990	0.990	0.993	0.983
5.	0.990	0.984	0.989	0.972
6.	0.977	0.962	0.974	0.933
7.	0.973	0.956	0.971	0.922
8.	0.967	0.945	0.964	0.903
9.	0.963	0.937	0.959	0.890
10.	0.959	0.930	0.955	0.879
11.	0.954	0.922	0.950	0.865
12.	0.951	0.917	0.947	0.856
13.	0.946	0.908	0.941	0.841
14.	0.919	0.895	0.934	0.818
15.	0.914	0.886	0.928	0.803
16.	0.925	0.869	0.919	0.776
17.	0.922	0.863	0.915	0.765
18.	0.910	0.842	0.904	0.731
19.	0.900	0.823	0.893	0.701
20.	0.895	0.814	0.888	0.688
21.	0.891	0.806	0.884	0.675
22.	0.883	0.792	0.876	0.654
23.	0.873	0.773	0.865	0.625
24.	0.859	0.749	0.852	0.590
25.	0.852	0.736	0.844	0.571
26.	0.835	0.708	0.828	0.531
27.	0.822	0.685	0.814	0.500
28.	0.810	0.665	0.803	0.475
29.	0.791	0.634	0.784	0.435
30.	0.776	0.611	0.768	0.407
31.	0.760	0.587	0.753	0.379
32.	0.742	0.560	0.735	0.349
33.	0.730	0.544	0.723	0.332
34.	0.706	0.512	0.699	0.299
35.	0.695	0.499	0.689	0.287
36.	0.679	0.479	0.672	0.268
37.	0.659	0.457	0.653	0.250
38.	0.642	0.437	0.635	0.233
39.	0.618	0.413	0.613	0.214
40.	0.596	0.392	0.590	0.199
41.	0.573	0.370	0.568	0.184
42.	0.555	0.357	0.553	0.175
43.	0.536	0.338	0.530	0.163
44.	0.510	0.317	0.505	0.151

```

. save nqr7_R2, replace
(Delete: file nqr7_R2.dta not found)
file nqr7_R2.dta saved

```

. log close

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```

nqr8_R2.do
* @RM500
* nqr8: BL-CF differences in mean smoke-years exposure
* based upon empirical smoke-survival curve and mortality
* of claimants in HRA audit files
* Relative risk quitting model hC(t) = 1 - (1 - hC(t-1))^2
* hC(t) = P(hg(t)) if T3 > year >= T2, where T2 = 1999
* hC(t) = R3*hb(t) if year >= T3, where T3 = 1999
* (R3) can be any value, not just 1; T3 can be any value, not just 1999
* Scenario pre-RR misconduct Estimate R1 R2 R3
* BL - 1.0 1.0 1.0
* CF yes 1.0 2.1 1.0
* CF yes 1.5 3.0 1.0
* CF yes 2.0 3.9 1.0

* Input files: nqr8, nqr4
* clear
* use drop _all
* set matsize 400
* set msg off
* set more off

log using nqr8, replace

* cutoff years for changes in quit rates are global variables $T1, $T2, $T3
* Relative increase in quit rate (on or after year T1) is global variable $R1
* Relative increase in quit rate (on or after year T2) is global variable $R2
* Relative increase in quit rate (on or after year T3) is global variable $R3
* (R3) can be any value, not just 1; T3 can be any value, not just 1999

* (1) Conditional distribution of birth year pi() among 'past' ever smokers
use nqr
* Save distribution of yrborn in Matrix pi(t)
* qui tab yrborn [waw], matcell(pi) matrow(t_)
* matrix pi = pi_result(t)
* matrix pi = t_., pi
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
* matrix colnames pi = t pi(t)
* global m = rowsof(pi)
* matrix drop t_
* matrix list pi

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked
drop _all
* Get L and SB from nqr4 output
use nqr4
* qui sum x
* global xMin = x(min)
* global N = _N

* LSB is proportion who are still smoking and alive
gen LSB = L*SB
* qui sum LSB
* EB is mean smoke-years taking mortality into account
* global EB = i(mean)*SN
di "Mean smoke-years (BL) = " %9.2f $EB
* LSBR3 = L(x)*SB(x)*R3; LSBR2 = L(x)*SB(x)*R2; LSBR1 = L(x)*SB(x)*R1
gen LSBR1 = .
gen LSBR2 = .
gen LSBR3 = .
* = SC SC

prog def LSC
$S_1 = T1; $S_2 = T2; $S_3 = T3; $S_4 = R1; $S_5 = R2; $S_6 = R3
* global T1 = $S_1
* global T2 = $S_2
* global T3 = $S_3
* global R1 = $S_4
* global R2 = $S_5
* global R3 = $S_6
* Check T3 > T2 > T1
* if $T2 <= $T1 | $T3 <= $T2 {
*   * Invalid "99.0f $T1,$T2,$T3
*   * quit
* }
* Compute SB(x)*R1 and L(x)*SB(x)*R1
* Compute SB(x)*R2 and L(x)*SB(x)*R2
* Compute SB(x)*R3 and L(x)*SB(x)*R3
* qui replace SB = SB*R1
* qui replace SB = SB*R2
* qui replace SB = SB*R3
* qui replace SC = SC + pi(t_.,2)
* Compute SC = SUM(t) pi(t_.,2)*L(x)*SB(x)*R3*SB(min(x,T1-t))^(1-R1)*
* SB(min(x,T2-t))^(R1-R2)*SB(min(x,T3-t))^(R2-R3) for all x
* Sum over index 'i' (rows of pi)
local i = 1
while 'i' <= $m {
  local t = pi['i',1]
  * 't' year of birth
  local u1 = $T1 - 't' - $xMin - 1
  local v1 = 'u1' + 1
  local u2 = $T2 - 't' - $xMin - 1
  local v2 = 'u2' + 1
  local u3 = min($T3 - 't' - $xMin - 1, SN)
  local v3 = 'u3' + 1
  * Compute intermediate 'areas'
  local A1 = SB['u1']^(1-$R1)
  local A2 = SB['u2']^(1-$R2)
  local A3 = SB['u3']^(1-$R3)
  * 'u3' > 'u2' > 'u1' required
  * Case A:
  if 'u3' <= 0 {
    * qui replace SC = SC + pi['i',2] * LSBR3
  }
  * Case B:
  else {
    if 'u3' > 0 & 'u2' <= 0 {
      * qui replace SC = SC + pi['i',2] * LSBR2 in 1/'u3'
      if 'v3' <= $N {
        * qui replace SC = SC + pi['i',2] * LSBR3 * 'A3' in 'v3'/$N
      }
    }
    * Case C:
    else {
      if 'u2' > 0 & 'u1' <= 0 {
        * qui replace SC = SC + pi['i',2] * LSBR1 in 1/'u2'
        * qui replace SC = SC + pi['i',2] * LSBR2 * 'A2' in 'v2'/'u3'
        if 'v3' <= $N {
          * qui replace SC = SC + pi['i',2] * LSBR3 * 'A2' * 'A3' in 'v3'/$N
        }
      }
    }
    * Case D:
    else {
      * qui replace SC = SC + pi['i',2] * LSB in 1/'u1'
      * qui replace SC = SC + pi['i',2] * LSBR1 * 'A1' in 'v1'/'u2'
      * qui replace SC = SC + pi['i',2] * LSBR2 * 'A1' * 'A2' in 'v2'/'u3'
    }
  }
}

```



keep, x USB SC-  
1. nod  
save nqr8\_R2, re  
1032

```

if 'V3' <= SN !
    (qui replace SC = SC + pi['i',2] * L$BR3 * 'A1' * 'A2' * 'A3' in 'V3'/'$N

```

```
local i = 'i' + 1
```

qui sum iud

global EC =  $r(\text{mean}) \cdot \text{CN}$

25 - 25

10

25,000,000 1930

$\Delta$	T1	R1	XB	XC	deltax
di	T2	R2			
	T3	R3			

U.S. 1954 1955 2001 1.0 2.1 1.0

25 - 01 25 Web imv

lab var SC lo "SC (R=1 post-2000) low est."

1.5C 1954 1963 2001 1.0 2.1 2.1

LSC 1954 1963 2001 1.0 2.4 1.0

0-1 0-3 0-1 1007 8961

---

Year	1954	1963	2002	1.0	3.6	1.0
1954	1.0	3.6	1.0			
1963		1.0	3.6			
2002			1.0			

1.5 2.4 1.0  
1954 1955 2001

```
.....Packet Change: change 3.0 to 1.0.....
```

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2
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Year	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100																																																																																																																																																			
Population	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447</

.....End Backer Change.....

25 = 25 uah i.r.b

Lab var SC<sub>1</sub> SC<sub>2</sub> SC<sub>3</sub> SC<sub>4</sub> SC<sub>5</sub> SC<sub>6</sub> SC<sub>7</sub> SC<sub>8</sub> SC<sub>9</sub> SC<sub>10</sub> SC<sub>11</sub> SC<sub>12</sub> SC<sub>13</sub> SC<sub>14</sub> SC<sub>15</sub> SC<sub>16</sub> SC<sub>17</sub> SC<sub>18</sub> SC<sub>19</sub> SC<sub>20</sub> SC<sub>21</sub> SC<sub>22</sub> SC<sub>23</sub> SC<sub>24</sub> SC<sub>25</sub> SC<sub>26</sub> SC<sub>27</sub> SC<sub>28</sub> SC<sub>29</sub> SC<sub>30</sub> SC<sub>31</sub> SC<sub>32</sub> SC<sub>33</sub> SC<sub>34</sub> SC<sub>35</sub> SC<sub>36</sub> SC<sub>37</sub> SC<sub>38</sub> SC<sub>39</sub> SC<sub>40</sub> SC<sub>41</sub> SC<sub>42</sub> SC<sub>43</sub> SC<sub>44</sub> SC<sub>45</sub> SC<sub>46</sub> SC<sub>47</sub> SC<sub>48</sub> SC<sub>49</sub> SC<sub>50</sub> SC<sub>51</sub> SC<sub>52</sub> SC<sub>53</sub> SC<sub>54</sub> SC<sub>55</sub> SC<sub>56</sub> SC<sub>57</sub> SC<sub>58</sub> SC<sub>59</sub> SC<sub>60</sub> SC<sub>61</sub> SC<sub>62</sub> SC<sub>63</sub> SC<sub>64</sub> SC<sub>65</sub> SC<sub>66</sub> SC<sub>67</sub> SC<sub>68</sub> SC<sub>69</sub> SC<sub>70</sub> SC<sub>71</sub> SC<sub>72</sub> SC<sub>73</sub> SC<sub>74</sub> SC<sub>75</sub> SC<sub>76</sub> SC<sub>77</sub> SC<sub>78</sub> SC<sub>79</sub> SC<sub>80</sub> SC<sub>81</sub> SC<sub>82</sub> SC<sub>83</sub> SC<sub>84</sub> SC<sub>85</sub> SC<sub>86</sub> SC<sub>87</sub> SC<sub>88</sub> SC<sub>89</sub> SC<sub>90</sub> SC<sub>91</sub> SC<sub>92</sub> SC<sub>93</sub> SC<sub>94</sub> SC<sub>95</sub> SC<sub>96</sub> SC<sub>97</sub> SC<sub>98</sub> SC<sub>99</sub> SC<sub>100</sub> SC<sub>101</sub> SC<sub>102</sub> SC<sub>103</sub> SC<sub>104</sub> SC<sub>105</sub> SC<sub>106</sub> SC<sub>107</sub> SC<sub>108</sub> SC<sub>109</sub> SC<sub>110</sub> SC<sub>111</sub> SC<sub>112</sub> SC<sub>113</sub> SC<sub>114</sub> SC<sub>115</sub> SC<sub>116</sub> SC<sub>117</sub> SC<sub>118</sub> SC<sub>119</sub> SC<sub>120</sub> SC<sub>121</sub> SC<sub>122</sub> SC<sub>123</sub> SC<sub>124</sub> SC<sub>125</sub> SC<sub>126</sub> SC<sub>127</sub> SC<sub>128</sub> SC<sub>129</sub> SC<sub>130</sub> SC<sub>131</sub> SC<sub>132</sub> SC<sub>133</sub> SC<sub>134</sub> SC<sub>135</sub> SC<sub>136</sub> SC<sub>137</sub> SC<sub>138</sub> SC<sub>139</sub> SC<sub>140</sub> SC<sub>141</sub> SC<sub>142</sub> SC<sub>143</sub> SC<sub>144</sub> SC<sub>145</sub> SC<sub>146</sub> SC<sub>147</sub> SC<sub>148</sub> SC<sub>149</sub> SC<sub>150</sub> SC<sub>151</sub> SC<sub>152</sub> SC<sub>153</sub> SC<sub>154</sub> SC<sub>155</sub> SC<sub>156</sub> SC<sub>157</sub> SC<sub>158</sub> SC<sub>159</sub> SC<sub>160</sub> SC<sub>161</sub> SC<sub>162</sub> SC<sub>163</sub> SC<sub>164</sub> SC<sub>165</sub> SC<sub>166</sub> SC<sub>167</sub> SC<sub>168</sub> SC<sub>169</sub> SC<sub>170</sub> SC<sub>171</sub> SC<sub>172</sub> SC<sub>173</sub> SC<sub>174</sub> SC<sub>175</sub> SC<sub>176</sub> SC<sub>177</sub> SC<sub>178</sub> SC<sub>179</sub> SC<sub>180</sub> SC<sub>181</sub> SC<sub>182</sub> SC<sub>183</sub> SC<sub>184</sub> SC<sub>185</sub> SC<sub>186</sub> SC<sub>187</sub> SC<sub>188</sub> SC<sub>189</sub> SC<sub>190</sub> SC<sub>191</sub> SC<sub>192</sub> SC<sub>193</sub> SC<sub>194</sub> SC<sub>195</sub> SC<sub>196</sub> SC<sub>197</sub> SC<sub>198</sub> SC<sub>199</sub> SC<sub>200</sub> SC<sub>201</sub> SC<sub>202</sub> SC<sub>203</sub> SC<sub>204</sub> SC<sub>205</sub> SC<sub>206</sub> SC<sub>207</sub> SC<sub>208</sub> SC<sub>209</sub> SC<sub>210</sub> SC<sub>211</sub> SC<sub>212</sub> SC<sub>213</sub> SC<sub>214</sub> SC<sub>215</sub> SC<sub>216</sub> SC<sub>217</sub> SC<sub>218</sub> SC<sub>219</sub> SC<sub>220</sub> SC<sub>221</sub> SC<sub>222</sub> SC<sub>223</sub> SC<sub>224</sub> SC<sub>225</sub> SC<sub>226</sub> SC<sub>227</sub> SC<sub>228</sub> SC<sub>229</sub> SC<sub>230</sub> SC<sub>231</sub> SC<sub>232</sub> SC<sub>233</sub> SC<sub>234</sub> SC<sub>235</sub> SC<sub>236</sub> SC<sub>237</sub> SC<sub>238</sub> SC<sub>239</sub> SC<sub>240</sub> SC<sub>241</sub> SC<sub>242</sub> SC<sub>243</sub> SC<sub>244</sub> SC<sub>245</sub> SC<sub>246</sub> SC<sub>247</sub> SC<sub>248</sub> SC<sub>249</sub> SC<sub>250</sub> SC<sub>251</sub> SC<sub>252</sub> SC<sub>253</sub> SC<sub>254</sub> SC<sub>255</sub> SC<sub>256</sub> SC<sub>257</sub> SC<sub>258</sub> SC<sub>259</sub> SC<sub>260</sub> SC<sub>261</sub> SC<sub>262</sub> SC<sub>263</sub> SC<sub>264</sub> SC<sub>265</sub> SC<sub>266</sub> SC<sub>267</sub> SC<sub>268</sub> SC<sub>269</sub> SC<sub>270</sub> SC<sub>271</sub> SC<sub>272</sub> SC<sub>273</sub> SC<sub>274</sub> SC<sub>275</sub> SC<sub>276</sub> SC<sub>277</sub> SC<sub>278</sub> SC<sub>279</sub> SC<sub>280</sub> SC<sub>281</sub> SC<sub>282</sub> SC<sub>283</sub> SC<sub>284</sub> SC<sub>285</sub> SC<sub>286</sub> SC<sub>287</sub> SC<sub>288</sub> SC<sub>289</sub> SC<sub>290</sub> SC<sub>291</sub> SC<sub>292</sub> SC<sub>293</sub> SC<sub>294</sub> SC<sub>295</sub> SC<sub>296</sub> SC<sub>297</sub> SC<sub>298</sub> SC<sub>299</sub> SC<sub>300</sub> SC<sub>301</sub> SC<sub>302</sub> SC<sub>303</sub> SC<sub>304</sub> SC<sub>305</sub> SC<sub>306</sub> SC<sub>307</sub> SC<sub>308</sub> SC<sub>309</sub> SC<sub>310</sub> SC<sub>311</sub> SC<sub>312</sub> SC<sub>313</sub> SC<sub>314</sub> SC<sub>315</sub> SC<sub>316</sub> SC<sub>317</sub> SC<sub>318</sub> SC<sub>319</sub> SC<sub>320</sub> SC<sub>321</sub> SC<sub>322</sub> SC<sub>323</sub> SC<sub>324</sub> SC<sub>325</sub> SC<sub>326</sub> SC<sub>327</sub> SC<sub>328</sub> SC<sub>329</sub> SC<sub>330</sub> SC<sub>331</sub> SC<sub>332</sub> SC<sub>333</sub> SC<sub>334</sub> SC<sub>335</sub> SC<sub>336</sub> SC<sub>337</sub> SC<sub>338</sub> SC<sub>339</sub> SC<sub>340</sub> SC<sub>341</sub> SC<sub>342</sub> SC<sub>343</sub> SC<sub>344</sub> SC<sub>345</sub> SC<sub>346</sub> SC<sub>347</sub> SC<sub>348</sub> SC<sub>349</sub> SC<sub>350</sub> SC<sub>351</sub> SC<sub>352</sub> SC<sub>353</sub> SC<sub>354</sub> SC<sub>355</sub> SC<sub>356</sub> SC<sub>357</sub> SC<sub>358</sub> SC<sub>359</sub> SC<sub>360</sub> SC<sub>361</sub> SC<sub>362</sub> SC<sub>363</sub> SC<sub>364</sub> SC<sub>365</sub> SC<sub>366</sub> SC<sub>367</sub> SC<sub>368</sub> SC<sub>369</sub> SC<sub>370</sub> SC<sub>371</sub> SC<sub>372</sub> SC<sub>373</sub> SC<sub>374</sub> SC<sub>375</sub> SC<sub>376</sub> SC<sub>377</sub> SC<sub>378</sub> SC<sub>379</sub> SC<sub>380</sub> SC<sub>381</sub> SC<sub>382</sub> SC<sub>383</sub> SC<sub>384</sub> SC<sub>385</sub> SC<sub>386</sub> SC<sub>387</sub> SC<sub>388</sub> SC<sub>389</sub> SC<sub>390</sub> SC<sub>391</sub> SC<sub>392</sub> SC<sub>393</sub> SC<sub>394</sub> SC<sub>395</sub> SC<sub>396</sub> SC<sub>397</sub> SC<sub>398</sub> SC<sub>399</sub> SC<sub>400</sub> SC<sub>401</sub> SC<sub>402</sub> SC<sub>403</sub> SC<sub>404</sub> SC<sub>405</sub> SC<sub>406</sub> SC<sub>407</sub> SC<sub>408</sub> SC<sub>409</sub> SC<sub>410</sub> SC<sub>411</sub> SC<sub>412</sub> SC<sub>413</sub> SC<sub>414</sub> SC<sub>415</sub> SC<sub>416</sub> SC<sub>417</sub> SC<sub>418</sub> SC<sub>419</sub> SC<sub>420</sub>

LSC 1954 1963 2001 1.5 3.0 3.0

qui gen SC} = SC

Lab var SC} SC (R=3 post-2000) middle est."

LSC 1954 1963 2001 1.5 3.6 1.0

Year	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
LSC	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100

LSC 1954 1963 2001 2.0 3.0 1.0

LSC	1954	1963	2001	2.0	3.6	1.0
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LSC	1954	1963	2001	2.0	3.9	1.0
-----	------	------	------	-----	-----	-----

```
qui gen sc_hi = sc
```

lab var SC\_hi "SC (R=1 post-2000) high est."

LSC 1954 1963 2001 2.0 3.9 3.9

LSC 1954 1963 1999 1.5 3.0 1.0

2000

range5C

```
gr SC_LSB x if x<=75,y1ab(0..25..5..75,1)x1ab(20,30,40,50,60,70)s(ii)c(JJ)11('Proportio  
n Still Alive and Smoking')saving(ngr8a.replace)  
gr SC_LSB x if x<=75,y1ab(0..25..5..75,1)x1ab(20,30,40,50,60,70)s(ii)c(JJ)11('Pro  
portion Still Alive and Smoking')saving(ngr8b.replace)
```

form LSB 5C\* 87.3E  
form x 86.0E

52614 0771

```

* Cutoff years for changes in quit rates are global variables $T1, $T2, $T3
* Relative increase in quit rate (on or after year T1) is global variable $R1
* Relative increase in quit rate (on or after year T2) is global variable $R2
* Relative increase in quit rate (on or after year T3) is global variable $R3
* [R] can be any value, not just 1: there can be any number of rows in any year

```

```

* (1) Conditional distribn of birth year pi() among 'past' ever smokers

```

```

use nqr

```

```

* Save distribution of yrborn in Matrix pi(t)
* qui tab yrborn [waw], matcell(pi) matrow(t_)

```

```

matrix pi = pi/_result(1)

```

```

matrix pi = t_., pi

```

```

* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
* matrix colnames pi = t pi(t)

```

```

global m = rowsof(pi)

```

```

matrix drop t_

```

```

matrix list pi

```

```

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked

```

```

drop _all

```

```

* Get L and SB from nqr4 output

```

```

use nqr4

```

```

* qui sum x

```

```

global $xMin = x(min)

```

```

global N = N

```

```

* L&B is proportion who are still smoking and alive

```

```

gen LSB = L*SB

```

```

* qui sum LSB

```

```

* SB is mean smoke-years taking mortality into account

```

```

global SB = x(mean)*$N

```

```

* Mean smoke-years (BL) = (L7) = $9.2f SEB
* 45.43

```

```

* LSBR1 = L(x)*SB(x)*R3; LSBR2 = L(x)*SB(x)*R2; LSBR1 = L(x)*SB(x)*R1

```

```

gen LSBR1 =
(R2 missing values generated)

```

```

gen LSBR2 =
(R2 missing values generated)

```

```

gen LSBR3 =
(R2 missing values generated)

```

```

gen SC =
(R2 missing values generated)

```

```

* Compute $LSC
1. $ = T1, $ = T2, $ = T3, $ = R2, $ = R3
2. global T1 = $2
3. global T2 = $2
4. global T3 = $3
5. global R1 = $4
6. global R2 = $5
7. global R3 = $6
8. Check T3 > T2 > T1
9. $T2 <= $T1 | $T3 <= $T2 (
10. di 'Invalid ', $9.0f $T1,$T2,$T3
11. exit
12. )
13. * Compute SC = SUM(t) pi(t)*L(x)*SB(x)*R3*SB(min(x,T1-t))^(1-R1)*
14. * SB(min(x,T2-t))^(R1-R2)*SB(min(x,T3-t))^(R2-R3) for all x
15. * Sum over index 'i' (rows of pi)
16. local i = 1
17. while 'i' <= $m (
18. local t = pi['i',1]
19. local ul = $T1 - 't' - $xMin - 1
20. local v1 = 'u1' + 1
21. local v2 = 'u2' + 1
22. local u3 = min($T3 - 't' - $xMin - 1,$N)
23. local v3 = 'u3' + 1
24. * Compute intermediate 'areas'
25. local A1 = SB['u1']^(1-$R1)
26. local A2 = SB['u2']^(1-$R2)
27. local A3 = SB['u3']^(1-$R3)
28. * 'u3' > 'u2' > 'u1' required
29. Case A:
30. if 'u3' <= 0 (
31. qui replace SC = SC + pi['i',2] * LSBR3
32. )
33. else (
34. Case B:
35. if 'u3' > 0 & 'u2' <= 0 (
36. qui replace SC = SC + pi['i',2] * LSBR2 in 1/'u3'
37. if 'v3' <= $N (
38. qui replace SC = SC + pi['i',2] * LSBR3 * 'A3' in 'v3'/$N
39. )
40. else (
41. Case C:
42. if 'u2' > 0 & 'u1' <= 0 (
43. qui replace SC = SC + pi['i',2] * LSBR1 in 1/'u2'
44. if 'v3' <= $N (
45. qui replace SC = SC + pi['i',2] * LSBR2 * 'A2' * 'A3' in 'v3'/$N
46. )
47. else (
48. )
49. )
50. )

```

	deltaX	XC	XB	R3	R2	R1	T3	T2	T1	rangeSC
45. . Case D:										
47.     qui replace SC = SC + pi('1',2) * LSB1 in '1/ul'										
48.     qui replace SC = SC + pi('1',2) * LSB1 in '1/ul'										
49.     qui replace SC = SC + pi('1',2) * LSB1 in '1/ul'										
50.     if 'V3' <= \$N (										
51.         qui replace SC = SC + pi('1',2) * LSB1 in '1/ul'										
52.     )										
53.     )										
54.     )										
55.     local i = '1' + 1										
56.     )										
57.     qui sum SC										
58.     global EC = r(meanj)*\$N										
59.     di %7.0f %71.7.0f %72.7.0f %73.7.0f %74.7.0f %75.7.0f %76.7.0f %77.7.0f %78.7.0f %79.7.0f %80.7.0f %81.7.0f %82.7.0f %83.7.0f %84.7.0f %85.7.0f %86.7.0f %87.7.0f %88.7.0f %89.7.0f %90.7.0f %91.7.0f %92.7.0f %93.7.0f %94.7.0f %95.7.0f %96.7.0f %97.7.0f %98.7.0f %99.7.0f %100.7.0f %101.7.0f %102.7.0f %103.7.0f %104.7.0f %105.7.0f %106.7.0f %107.7.0f %108.7.0f %109.7.0f %110.7.0f %111.7.0f %112.7.0f %113.7.0f %114.7.0f %115.7.0f %116.7.0f %117.7.0f %118.7.0f %119.7.0f %120.7.0f %121.7.0f %122.7.0f %123.7.0f %124.7.0f %125.7.0f %126.7.0f %127.7.0f %128.7.0f %129.7.0f %130.7.0f %131.7.0f %132.7.0f %133.7.0f %134.7.0f %135.7.0f %136.7.0f %137.7.0f %138.7.0f %139.7.0f %140.7.0f %141.7.0f %142.7.0f %143.7.0f %144.7.0f %145.7.0f %146.7.0f %147.7.0f %148.7.0f %149.7.0f %150.7.0f %151.7.0f %152.7.0f %153.7.0f %154.7.0f %155.7.0f %156.7.0f %157.7.0f %158.7.0f %159.7.0f %160.7.0f %161.7.0f %162.7.0f %163.7.0f %164.7.0f %165.7.0f %166.7.0f %167.7.0f %168.7.0f %169.7.0f %170.7.0f %171.7.0f %172.7.0f %173.7.0f %174.7.0f %175.7.0f %176.7.0f %177.7.0f %178.7.0f %179.7.0f %180.7.0f %181.7.0f %182.7.0f %183.7.0f %184.7.0f %185.7.0f %186.7.0f %187.7.0f %188.7.0f %189.7.0f %190.7.0f %191.7.0f %192.7.0f %193.7.0f %194.7.0f %195.7.0f %196.7.0f %197.7.0f %198.7.0f %199.7.0f %200.7.0f %201.7.0f %202.7.0f %203.7.0f %204.7.0f %205.7.0f %206.7.0f %207.7.0f %208.7.0f %209.7.0f %210.7.0f %211.7.0f %212.7.0f %213.7.0f %214.7.0f %215.7.0f %216.7.0f %217.7.0f %218.7.0f %219.7.0f %220.7.0f %221.7.0f %222.7.0f %223.7.0f %224.7.0f %225.7.0f %226.7.0f %227.7.0f %228.7.0f %229.7.0f %230.7.0f %231.7.0f %232.7.0f %233.7.0f %234.7.0f %235.7.0f %236.7.0f %237.7.0f %238.7.0f %239.7.0f %240.7.0f %241.7.0f %242.7.0f %243.7.0f %244.7.0f %245.7.0f %246.7.0f %247.7.0f %248.7.0f %249.7.0f %250.7.0f %251.7.0f %252.7.0f %253.7.0f %254.7.0f %255.7.0f %256.7.0f %257.7.0f %258.7.0f %259.7.0f %260.7.0f %261.7.0f %262.7.0f %263.7.0f %264.7.0f %265.7.0f %266.7.0f %267.7.0f %268.7.0f %269.7.0f %270.7.0f %271.7.0f %272.7.0f %273.7.0f %274.7.0f %275.7.0f %276.7.0f %277.7.0f %278.7.0f %279.7.0f %280.7.0f %281.7.0f %282.7.0f %283.7.0f %284.7.0f %285.7.0f %286.7.0f %287.7.0f %288.7.0f %289.7.0f %290.7.0f %291.7.0f %292.7.0f %293.7.0f %294.7.0f %295.7.0f %296.7.0f %297.7.0f %298.7.0f %299.7.0f %300.7.0f %301.7.0f %302.7.0f %303.7.0f %304.7.0f %305.7.0f %306.7.0f %307.7.0f %308.7.0f %309.7.0f %310.7.0f %311.7.0f %312.7.0f %313.7.0f %314.7.0f %315.7.0f %316.7.0f %317.7.0f %318.7.0f %319.7.0f %320.7.0f %321.7.0f %322.7.0f %323.7.0f %324.7.0f %325.7.0f %326.7.0f %327.7.0f %328.7.0f %329.7.0f %330.7.0f %331.7.0f %332.7.0f %333.7.0f %334.7.0f %335.7.0f %336.7.0f %337.7.0f %338.7.0f %339.7.0f %340.7.0f %341.7.0f %342.7.0f %343.7.0f %344.7.0f %345.7.0f %346.7.0f %347.7.0f %348.7.0f %349.7.0f %350.7.0f %351.7.0f %352.7.0f %353.7.0f %354.7.0f %355.7.0f %356.7.0f %357.7.0f %358.7.0f %359.7.0f %360.7.0f %361.7.0f %362.7.0f %363.7.0f %364.7.0f %365.7.0f %366.7.0f %367.7.0f %368.7.0f %369.7.0f %370.7.0f %371.7.0f %372.7.0f %373.7.0f %374.7.0f %375.7.0f %376.7.0f %377.7.0f %378.7.0f %379.7.0f %380.7.0f %381.7.0f %382.7.0f %383.7.0f %384.7.0f %385.7.0f %386.7.0f %387.7.0f %388.7.0f %389.7.0f %390.7.0f %391.7.0f %392.7.0f %393.7.0f %394.7.0f %395.7.0f %396.7.0f %397.7.0f %398.7.0f %399.7.0f %400.7.0f %401.7.0f %402.7.0f %403.7.0f %404.7.0f %405.7.0f %406.7.0f %407.7.0f %408.7.0f %409.7.0f %410.7.0f %411.7.0f %412.7.0f %413.7.0f %414.7.0f %415.7.0f %416.7.0f %417.7.0f %418.7.0f %419.7.0f %420.7.0f %421.7.0f %422.7										

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3: qui gen SC_lo = SC
4: lab va: SC_lo "SC (R=1 post-2000) low est."

```

5. LSC 1954 1963 2001 1.0 2.1 2.1
6. LSC 1954 1963 2001 1.0 2.4 1.0
7. LSC 1954 1963 2001 1.0 3.0 1.0
8. LSC 1954 1963 2001 1.0 3.6 1.0

LSC 1954 1963 2001 1.5 2.4 1.0

.....Wecker Change: change 1.0 to 1.0\*\*\*\*\*

\*L5C 1954 1963 2001 1.5 3.0 1.0

LSC 1954 1963 2001 1.5 1.0 1.0

\*\*\*\*\*End Wecker Change\*\*\*\*\*

(past)

remove asbestos-specific  
quit rate effect

qui gerit  $S_1^2 = S_2^2$

12.	lab var SC_	*SC (R=1 post-2000) middle est."
13.	LSC 1954 1963 2001	1.5 3.0 3.0

14. qui yen SC} = SC

15. lab var SC3 "SC (R=3 post-2000) middle est."

15.

Year	1954	1963	2001	1.5	3.6	1.0
LSC	1954	1963	2001	1.5	3.6	1.0

17.	LSC	1954	1963	2001	2.0	2.4	1.0
18.	LSC	1954	1963	2001	3.0	3.0	1.0

[illegible]

	L5C	1954	1963	2001	2.0	3.9	1.0
20.							

21. qui gen sc\_hi = sc

22. lab var SC\_hi - SC (R=1 post-2000) high est. -

	LSC	1954	1963	2001	2.0	3.9	3.9
23.							

24. 1954 1963 1969 153010

25. LSC 1954 1963 2000 1.5 3.0 1.0

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```
. end
```

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**1000**

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log

28.	44	0.810	0.715	0.790	0.559
29.	45	0.791	0.682	0.771	0.513
30.	46	0.776	0.657	0.755	0.480
31.	47	0.760	0.631	0.739	0.445
32.	48	0.742	0.601	0.721	0.410
33.	49	0.730	0.582	0.709	0.375
34.	50	0.705	0.545	0.685	0.340
35.	51	0.695	0.529	0.675	0.323
36.	52	0.678	0.505	0.659	0.297
37.	53	0.659	0.478	0.640	0.270
38.	54	0.642	0.453	0.623	0.245
39.	55	0.618	0.422	0.600	0.216
40.	56	0.596	0.394	0.578	0.192
41.	57	0.573	0.366	0.556	0.168
42.	58	0.559	0.349	0.542	0.155
43.	59	0.536	0.324	0.520	0.137
44.	60	0.510	0.297	0.495	0.118
45.	61	0.492	0.279	0.478	0.107
46.	62	0.473	0.261	0.459	0.096
47.	63	0.448	0.238	0.434	0.083
48.	64	0.428	0.221	0.416	0.074
49.	65	0.411	0.207	0.399	0.067
50.	66	0.390	0.191	0.378	0.060
51.	67	0.374	0.179	0.363	0.055
52.	68	0.355	0.166	0.345	0.049
53.	69	0.335	0.152	0.325	0.044
54.	70	0.315	0.141	0.307	0.040
55.	71	0.299	0.130	0.290	0.036
56.	72	0.285	0.122	0.276	0.034
57.	73	0.272	0.116	0.265	0.032
58.	74	0.260	0.109	0.252	0.030
59.	75	0.250	0.101	0.242	0.028
60.	76	0.236	0.090	0.229	0.026
61.	77	0.222	0.080	0.216	0.024
62.	78	0.210	0.070	0.207	0.023
63.	79	0.203	0.060	0.201	0.022
64.	80	0.191	0.050	0.191	0.021
65.	81	0.176	0.040	0.171	0.019
66.	82	0.160	0.030	0.161	0.018
67.	83	0.141	0.020	0.151	0.017
68.	84	0.159	0.010	0.150	0.017
69.	85	0.158	0.000	0.151	0.017
70.	86	0.157	0.003	0.152	0.017
71.	87	0.149	0.000	0.145	0.016
72.	88	0.141	0.000	0.137	0.015
73.	89	0.127	0.000	0.123	0.014
74.	90	0.126	0.000	0.123	0.014
75.	91	0.126	0.000	0.123	0.014
76.	92	0.126	0.000	0.123	0.014
77.	93	0.126	0.000	0.123	0.014
78.	94	0.111	0.000	0.111	0.010
79.	95	0.111	0.000	0.111	0.010
80.	96	0.111	0.000	0.111	0.010
81.	97	0.111	0.000	0.111	0.010
82.	98	0.111	0.000	0.111	0.010

save nqr8\_R2, replace  
(Note: file nqr8\_R2.dta not found)  
file nqr8\_R2.dta saved

log close

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ndx4\_R2.do

```
* BaseLine scenario: Mean Years Smoked
di %9.1f $XB
log def Results = Desat in mean years smoked
* Produces low, med, and high estimates of CVD mortality rates 2000, misconduct
clear
prog drop _all
set matsize 500
set rmseg off
set more off
```

```
log using ndx4, replace
* Future claimants: Effects of decreased initiation
```

```
* Compute frequency distributions
log def Freq
qui gen f5_1 = f5_1 - f5_1[_n-1]
```

```
freq B
freq C_lo
freq C_
freq C_hi
drop F*
drop in 1
format %7.1f
format %6.0f
```

```
* Combine with results on Past Claimants: Effect of Increase Quit Rates
merge x using ndx4_R2
ren L5B SB
ren byte n = _N - _n
sort n
drop n
```

```
* Compute conditional means
prog def CondMean
qui replace ss_1 = ss_1[_n-1] if ss_1 == .
qui gen mS_1 = sum(ss_1)
qui replace mC_1 = mS_1/ss_1
end
```

```
CondMean B
CondMean C_lo
CondMean C_
CondMean C_hi
keep x f* m*
format %7.3f
sort x
drop if fb == .
```

```
* Compute Mean Years Smoked (X)
prog def mX
qui gen ss_1 = f5_1 * mS_1
qui sum ss_1
global X5_1 = r(mean)*r(N)
drop ss_1
end
```

```
mX B
mX C_lo
mX C_
mX C_hi
```

```
* Convert results to matrix & save
matrix def dx = J(2,3,0)
matrix def dx = J(1,3,0)
matrix dx[1,1] = $XB - $XC_lo
matrix dx[1,2] = $XB - $XC_
matrix dx[1,3] = $XB - $XC_hi
* Save results to matrix
gen byte Era = 1
lab def Era 1 "Past" 2 "Future"
lab val Era Era
order Era Scenario dx_lo dx_hi
form dx* %9.2f
save ndx4_R2, replace
log close
\032
```

Produced by BARTC  
HUMPHREY

ndx4.log

\* Future claimants: Effects of decreased initiation

```
use m16
* Compute frequency distributions
prog def freq
1. qui gen f2_1 = F2_1 - F2_1[_n-1]
2. end
```

freq B

freq C\_lo

freq C\_

freq C\_hi

drop F\*

drop in 1

if observation deleted)

form f\* v7.3f

form x v5.0f

\* Combine with results on Past Claimants: Effect of Increase Quit Rates

merge x using m16 R2

ren L2B SB

\* Reverse sort order to compute conditional means

gen byte n = \_n\_

sort n

drop n

\* Compute conditional means

```
prog def cndmean
1. qui replace S2_1 = S2_1[_n-1] if S2_1 == .
2. qui gen m2_1 = sum(S2_1)
3. qui replace m2_1 = m2_1/S2_1
4. end
```

cndmean B

cndmean C\_lo

cndmean C\_

cndmean C\_hi

keep x f\* m\*

form m\* v7.3f

sort x

drop if fB == .

(48 observations deleted)

produced by RRTC

in

mx C\_

HUMPHREY

Selected Ratio: Mean Years Smoked

32.2

prog def Results

```
1. di "---- Decrease in mean years smoked ----"
2. di "Post-2000 Low Middle High"
3. di "Misconduct Est. Est. Est."
4. di "No "A12.1f $XB - $XC_lo, A12.1f $XB - $XC_ A12.1f $XB - $XC_hi"
5. end
```

Results

```
---- Decrease in mean years smoked ----
Post-2000 Low Middle High
Misconduct Est. Est. Est.
No 6.9 1.9 13.3
```

\* Convert results to matrix & save

\* matrix def dx = J(2,3,0)

\* matrix def dx = J(1,3,0)

\* matrix dx[1,1] = \$XB - \$XC\_lo

\* matrix dx[1,2] = \$XB - \$XC\_

\* matrix dx[1,3] = \$XB - \$XC\_hi

drop \_all

svmat dx

number of observations will be reset to 1  
Press any key to continue, or Break to abort  
obs was 0, now 1

gen byte Scenario = \_n

lab def Scenario 1 "No-Post2000" 2 "Post2000"

lab val Scenario Scenario

ren dx1 dx\_lo

ren dx2 dx

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ndx4.log

```
ten dx3 dx_hi
gen byte Era = 1
lab def Era 1-Past 2-Future
lab val Era Era
order Era Scenario dx_lo dx dx_hi
form dx- v9.24
save ndx4_R2. replace
(Note: file ndx4_R2.dta not found)
file ndx4_R2.dta saved
1
Era Scenario dx_lo
Past No-Post2000 6.86
log close
```

produced by RJRTC  
(part)

in

HUMPHREY

dx  
1.94

dx\_lo  
13.85

c.f. Harris's reduction in mean smokyrs of 10.65

52614 0777

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```

* LIMDEP 7.0 source code:
Multivariate normal analysis of:
1. cumulative incidence of Lung Cancer (diedLC);
2. prevalence of parenchymal disease (anyPleu);
3. abnormal pulmonary function by spirometric
determination of FVC (PFT); and
4. Pleural injury (anyPleu)
This 'main' version assumes that there is no relationship between
smoking and pleural injury.
Exposure results based upon assumption of no misconduct post-2000.

```

```

* Restrict analysis to main sample (2,243) rather than
extended sample (2,509) */
reject: new; w = 0 $
skip

```

```

* RHS variables (including years smoked, age categories, and
categories of post-latency asbestos exposure as 'X' */
namelist: X = one, smokyrs, ageG*, T10.* $

```

```

* Separate namelist with years smoked dropped for pleural disease
dose-response models only */
namelist: Xo = one, ageG*, T10.* $

```

```

* Descriptive statistics (sample means) of RHS variables */
dstat: rhs = X $

```

```

* Save sample mean values of X's (and constant) in X_BL,
which corresponds to baseline scenario (BL) */
matrix: Xmeans = part(LastDsta, 1, 7, 1, 1) $
* Append 1 to vector of sample means */
matrix: u = {1} $
matrix: X_BL = {u / Xmeans} $

```

```

* Construct conformal vector for Xo_BL */
dstat: rhs = Xo $

```

```

matrix: Xomeans = part(LastDsta, 1, 6, 1, 1) $
matrix: Xo_BL = {u / Xomeans} $

```

```

* Univariate models: Show marginal effects.
Note: LIMDEP computes partial derivatives df/dXi, while
Stats by default shows discrete effects deltaP/deltaXi. */

```

```

probit: lhs = diedLC; rhs = X; marginal effects $
matrix: b_LC = B $

probit: lhs = Par; rhs = X; marginal effects $
matrix: b_Par = B $

probit: lhs = PFT; rhs = X; marginal effects $
matrix: b_PFT = B $

```

```

/* Note change in RHS for anyPleu */
probit: lhs = anyPleu; rhs = Xo; marginal effects $
matrix: b_Ple = B $

```

```

/* Pairwise Bivariate probit models */

```

```

bivariate: lhs = diedLC, Par; rh1 = X; rh2 = X;
start = b_LC, b_Par; marginal effects $
matrix: b_LC = part(B, 1, 8) $
calc: rhoLCPar = rho $

```

```

bivariate: lhs = Par, PFT; rh1 = X; rh2 = X;
start = b_Par, b_PFT; marginal effects $
matrix: b_Par = part(B, 1, 9, 1, 1) $
calc: rhoParPFT = rho $

bivariate: lhs = diedLC, anyPleu; rh1 = X; rh2 = Xo;
start = b_LC, b_Ple; marginal effects $
matrix: b_LC = part(B, 1, 15) $
calc: rhoLCPCle = rho $

```

```

/* Note change in RHS for anyPleu */
bivariate: lhs = diedLC, anyPleu; rh1 = X; rh2 = Xo;
start = b_LC, b_Ple; marginal effects $
matrix: b_LC = part(B, 1, 15) $
calc: rhoLCPCle = rho $

```

```

/* Note change in RHS for anyPleu */
bivariate: lhs = Par, anyPleu; rh1 = X; rh2 = Xo;
start = b_Par, b_Ple; marginal effects $
matrix: b_Par = part(B, 1, 15) $
calc: rhoParPle = rho $

```

```

/* Note change in RHS for anyPleu */
bivariate: lhs = PFT, anyPleu; rh1 = X; rh2 = Xo;
start = b_PFT, b_Ple; marginal effects $
calc: rhoPFTPl = rho $

```

```

/* 4x4 Variance-covariance matrix for multivariate
normal calculations */

```

```

matrix: Omega4 = {1 /
rhoLCPar, 1 /
rhoLCPCle, rhoParPFT, 1 /
rhoLCPCle, rhoParPFT, 1} $

```

```

/* 3x3 Variance-covariance submatrix for multivariate
normal calculations */

```

```

matrix: Omega3 = Part(Omega4, 1, 3, 1, 3) $

```

```

/* Computation of indices XB at (baseline) means of X
from probit models */

```

```

matrix: Y_LC = X_BL'b_LC $
matrix: Y_Par = X_BL'b_Par $
matrix: Y_PFT = X_BL'b_PFT $
/* Note change in code for pleural */
matrix: Y_Ple = Xo_BL'b_Ple $

```

```

/* Counterfactual values of indices (past) - no post-2000 misconduct */

```

```

matrix: Y_LC_D = Y_LC - 1.94*Part(b_LC,2,2,1,1) $
matrix: Y_LC_PHi = Y_LC - 1.94*Part(b_LC,2,2,1,1) $
matrix: Y_LC_PLo = Y_LC - 1.94*Part(b_LC,2,2,1,1) $
matrix: Y_Pa_D = Y_Par - 1.94*Part(b_Par,2,2,1,1) $
matrix: Y_Pa_PHi = Y_Par - 1.94*Part(b_Par,2,2,1,1) $
matrix: Y_Pa_PLo = Y_Par - 1.94*Part(b_Par,2,2,1,1) $
matrix: Y_PFT_D = Y_PFT - 1.94*Part(b_PFT,2,2,1,1) $
matrix: Y_PFT_PHi = Y_PFT - 1.94*Part(b_PFT,2,2,1,1) $
matrix: Y_PFT_PLo = Y_PFT - 1.94*Part(b_PFT,2,2,1,1) $

```

```

/* Note change in code for pleural disease */

```

```

matrix: Y_Pi_D = Y_Ple $
matrix: Y_Pi_PHi = Y_Ple $
matrix: Y_Pi_PLo = Y_Ple $

```

```

/* Counterfactual values of indices (future) - no post-2000 misconduct */

```



```

matrix: y_LC_f = y_LC - 12.08*Part(b_LC,2,2,1,1) $
matrix: y_LC_fhi = y_LC - 12.08*Part(b_LC,2,2,1,1) $
matrix: y_LC_flo = y_LC - 12.08*Part(b_LC,2,2,1,1) $

matrix: y_Pa_f = y_Pa - 12.08*Part(b_Pa,2,2,1,1) $
matrix: y_Pa_fhi = y_Pa - 12.08*Part(b_Pa,2,2,1,1) $
matrix: y_Pa_flo = y_Pa - 12.08*Part(b_Pa,2,2,1,1) $

matrix: y_PF_f = y_PF - 12.08*Part(b_PFT,2,2,1,1) $
matrix: y_PF_fhi = y_PF - 12.08*Part(b_PFT,2,2,1,1) $
matrix: y_PF_flo = y_PF - 12.08*Part(b_PFT,2,2,1,1) $

/* Note change in code for pleural disease */
matrix: y_Pl_f = y_Ple $
matrix: y_Pl_fhi = y_Ple $
matrix: y_Pl_flo = y_Ple $

/* Probability of still getting LC {p11} */
calc: p_LC = phi(y_LC) $
calc: p11_p = phi(y_LC,p1)/p_LC $
calc: p11_plo = phi(y_LC,plo)/p_LC $
calc: p11_phi = phi(y_LC,phi)/p_LC $
calc: p11_f = phi(y_LC,f)/p_LC $
calc: p11_flo = phi(y_LC,flo)/p_LC $
calc: p11_fhi = phi(y_LC,fhi)/p_LC $

/* Probability of not getting LC but instead getting
Disabling BID (Par and PFT) (p21): as well as
Probability of not getting LC but instead getting
Non-disabling BID (Par and not PFT) (p31) */

/* Use Greene's sign convention matrix (page 229) */
matrix: T = {1,0,0,0,1,0,0,0,-1} $
matrix: Omega3A = T*Omega3*T $

matrix: z0 = (y_LC / y_Pa_p / y_PF_p | $
matrix: z1 = (y_LC_p / y_Pa_p / y_PF_p | $
calc: p21_p = (Mv(z0,Omega3) - Mv(z1,Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_p = (Mv(z0A,Omega3A) - Mv(z1A,Omega3A))/p_LC $

matrix: z0 = (y_LC / y_Pa_plo / y_PF_plo | $
matrix: z1 = (y_LC_plo / y_Pa_plo / y_PF_plo | $
calc: p21_plo = (Mv(z0,Omega3) - Mv(z1,Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_plo = (Mv(z0A,Omega3A) - Mv(z1A,Omega3A))/p_LC $

matrix: z0 = (y_LC / y_Pa_phi / y_PF_phi | $
matrix: z1 = (y_LC_phi / y_Pa_phi / y_PF_phi | $
calc: p21_phi = (Mv(z0,Omega3) - Mv(z1,Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_phi = (Mv(z0A,Omega3A) - Mv(z1A,Omega3A))/p_LC $

matrix: z0 = (y_LC / y_Pa_f / y_PF_f | $
matrix: z1 = (y_LC_f / y_Pa_f / y_PF_f | $
calc: p21_f = (Mv(z0,Omega3) - Mv(z1,Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_f = (Mv(z0A,Omega3A) - Mv(z1A,Omega3A))/p_LC $

```

```

matrix; z0 = [y_LC / y_Pa_flo / y_PF_flo ] $
matrix; z1 = [y_LC_flo / y_Pa_flo / y_PF_flo ] $
calc; p21_flo = (Mvn(z0,Omega3) - Mvn(z1,Omega3))/p21_flo $
matrix; z0A = T*(z0 - Mvn(z0,Omega3)) $
matrix; p1_flo = T*(z0 - Mvn(z0,Omega3)) $
matrix; p1_flo = (Mvn(z0A,Omega3) - Mvn(z1,Omega3A))/p1_flo $
matrix; z0 = [y_LC / y_Pa_fhi / y_PF_fhi ] $
matrix; z1 = [y_LC_fhi / y_Pa_fhi / y_PF_fhi ] $
calc; p21_fhi = (Mvn(z0,Omega3) - Mvn(z1,Omega3))/p1_flo $
matrix; z0A = T*(z0 - Mvn(z0,Omega3)) $
matrix; z1A = T*(z1 - Mvn(z1,Omega3)) $
matrix; p1_fhi = (Mvn(z0A,Omega3A) - Mvn(z1A,Omega3A))/p1_flo $
/* Collect results in subdiagonal matrices and clean up.* */
matrix; P_p = Idn(4) $
matrix; P_p(1,1) = p11_p $
matrix; P_p(2,1) = p21_p $
matrix; P_p(3,1) = p31_p $
calc; delete p11_p, p21_p, p31_p $
matrix; P plo'(1,1) = p11_plo $
matrix; P plo(2,1) = p21_plo $
matrix; P plo(3,1) = p31_plo $
calc; delete p11_plo, p21_plo, p31_plo $
matrix; P phi(1,1) = p11_phi $
matrix; P phi(2,1) = p21_phi $
matrix; P phi(3,1) = p31_phi $
calc; delete p11_phi, p21_phi, p31_phi $
matrix; P f(1,1) = p11_f $
matrix; P f(2,1) = p21_f $
matrix; P f(3,1) = p31_f $
calc; delete p11_f, p21_f, p31_f $
matrix; P flo(1,1) = p11_flo $
matrix; P flo(2,1) = p21_flo $
matrix; P flo(3,1) = p31_flo $
calc; delete p11_flo, p21_flo, p31_flo $
matrix; P fhi(1,1) = p11_fhi $
matrix; P fhi(2,1) = p21_fhi $
matrix; P fhi(3,1) = p31_fhi $
calc; delete p11_fhi, p21_fhi, p31_fhi $
/* Probability of not getting LC but instead getting
pleural disease only (p41) */
/* Construct new 3x3 submatrix of Omega4 that gives only
correlations of LC, Par, and Pl */
matrix; Omega3 = [ 1 /
rhoLCPar, 1 /
rhoLCPlc, rhoParPl, 1] $

```

17

# Ms8a\_R2.1im

```

matrix: z0 = [Y_LC/ Y_Par/ Y_PFT/ Y_PL_P] $
matrix: z1 = [Y_LC/ Y_Pa_P/ Y_PFT/ Y_PL_P] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_p = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC/ Y_Par/ Y_PFT/ Y_PL_Plo] $
matrix: z1 = [Y_LC/ Y_Pa_Plo/ Y_PFT/ Y_PL_Plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_DBID $

matrix: z0 = [Y_LC/ Y_Par/ Y_PFT/ Y_PL_Phi] $
matrix: z1 = [Y_LC/ Y_Pa_Phi/ Y_PFT/ Y_PL_Phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC/ Y_Par/ Y_PFT/ Y_PL_flo] $
matrix: z1 = [Y_LC/ Y_Pa_flo/ Y_PFT/ Y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_DBID $

matrix: z0 = [Y_LC/ Y_Par/ Y_PFT/ Y_PL_fhi] $
matrix: z1 = [Y_LC/ Y_Pa_fhi/ Y_PFT/ Y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_DBID $

* Collect results and clean up. *
matrix: P_p(4,2) = p42_p $
matrix: P_plo(4,2) = p42_plo $
matrix: P_phi(4,2) = p42_phi $
matrix: P_flo(4,2) = p42_flo $
matrix: P_fhi(4,2) = p42_fhi $
calc: delete p42_p, p42_plo, p42_phi $
calc: delete p42_flo, p42_flo, p42_fhi $

* Probability of NBID in BL *
matrix: T = [-1.0, 0, 0.1, 0, 0, 0, -1] $
matrix: Omega3A = T*Omega3 $
matrix: Omega3A = T*Omega3 $

matrix: z = [Y_LC / Y_Par / Y_PFT] $
matrix: zA = T*20 $
calc: p_NBID = Mvn(zA, Omega3A) $

* Probability of NBID in BL and NBID in CF *
matrix: z0 = [Y_LC / Y_Pa_P / Y_PFT] $
matrix: z0A = T*20 $
calc: p33_p = Mvn(z0A, Omega3A)/p_NBID $

matrix: z0 = [Y_LC / Y_Pa_Plo / Y_PFT] $
matrix: z0A = T*20 $
calc: p33_plo = Mvn(z0A, Omega3A)/p_NBID $

matrix: z0 = [Y_LC / Y_Pa_Phi / Y_PFT] $
matrix: z0A = T*20 $
calc: p33_phi = Mvn(z0A, Omega3A)/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_P] $
matrix: z1 = [Y_LC / Y_Pa_P / Y_PFT / Y_PL_P] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_p = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Plo] $
matrix: z1 = [Y_LC / Y_Pa_Plo / Y_PFT / Y_PL_Plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Phi] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT / Y_PL_Phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_flo] $
matrix: z1 = [Y_LC / Y_Pa_flo / Y_PFT / Y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_fhi] $
matrix: z1 = [Y_LC / Y_Pa_fhi / Y_PFT / Y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

```

```

matrix: z0 = [Y_LC / Y_Pa_Phi / Y_PFT] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Pa_Plo / Y_PFT] $
matrix: z1 = [Y_LC / Y_Pa_Plo / Y_PFT] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Pa_Phi / Y_PFT] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_P] $
matrix: z1 = [Y_LC / Y_Pa_P / Y_PFT / Y_PL_P] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_p = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Plo] $
matrix: z1 = [Y_LC / Y_Pa_Plo / Y_PFT / Y_PL_Plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Phi] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT / Y_PL_Phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_flo] $
matrix: z1 = [Y_LC / Y_Pa_flo / Y_PFT / Y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_fhi] $
matrix: z1 = [Y_LC / Y_Pa_fhi / Y_PFT / Y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

* Probability of PL but not NBID in CF given NBID in BL *
* Use Omega4 matrix *
matrix: T = [-1.0, 0, 0, 0.1, 0, 0, 0, -1, 0, 0, 0, 0, 1] $
matrix: Omega4A = T*Omega4 $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_P] $
matrix: z1 = [Y_LC / Y_Pa_P / Y_PFT / Y_PL_P] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_p = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Plo] $
matrix: z1 = [Y_LC / Y_Pa_Plo / Y_PFT / Y_PL_Plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Phi] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT / Y_PL_Phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_flo] $
matrix: z1 = [Y_LC / Y_Pa_flo / Y_PFT / Y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_fhi] $
matrix: z1 = [Y_LC / Y_Pa_fhi / Y_PFT / Y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A))/p_NBID $

```

```
matrix: z1A = T*z1 $
calc: p43_fhi = Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)/p_P1 $
```

```
* Collect results and clean up. */
```

```
matrix: P_p(4,3) = p43_p $
matrix: P_plo(4,3) = p43_plo $
matrix: P_phi(4,3) = p43_phi $
matrix: P_f(4,3) = p43_f $
matrix: P_flo(4,3) = p43_flo $
matrix: P_fhi(4,3) = p43_fhi $
calc: delete p43_p, p43_plo, p43_phi $
calc: delete p43_f, p43_flo, p43_fhi $
```

```
/* Probability of pleural injury in BL */
/* Recreate 3x3 submatrix of Omega3 that gives only
correlations of LC, Par, and Pl */
```

```
matrix: Omega3 = 1 /
  rhoLCPar, 1 /
  rhoLCple, rhoParPl, 1) $
matrix: T = 1-1, 0, 0 / 0, -1, 0 / 0, 0, 1) $
matrix: Omega3A = T*Omega3*T $
matrix: z0 = [y_LC / y_Par / y_Ple ] $
matrix: z0A = T*z0 $
calc: p_P1 = Mvn(z0A, Omega3A) $
```

```
* Probability of Pl in CF given Pl in BL */
```

```
matrix: z1 = [y_LC / y_Par / y_P1_p] $
matrix: z1A = T*z1 $
calc: p44_P1 = Mvn(z1A, Omega3A)/p_P1 $
matrix: z1 = [y_LC / y_Par / y_P1_plo] $
matrix: z1A = T*z1 $
calc: p44_P1lo = Mvn(z1A, Omega3A)/p_P1 $
matrix: z1 = [y_LC / y_Par / y_P1_phi] $
matrix: z1A = T*z1 $
calc: p44_P1phi = Mvn(z1A, Omega3A)/p_P1 $
```

```
matrix: z1 = [y_LC / y_Par / y_P1_f] $
matrix: z1A = T*z1 $
calc: p44_f = Mvn(z1A, Omega3A)/p_P1 $
```

```
matrix: z1 = [y_LC / y_Par / y_P1_flo] $
matrix: z1A = T*z1 $
calc: p44_flo = Mvn(z1A, Omega3A)/p_P1 $
```

```
matrix: z1 = [y_LC / y_Par / y_P1_fhi] $
matrix: z1A = T*z1 $
calc: p44_fhi = Mvn(z1A, Omega3A)/p_P1 $
```

```
* Collect results and clean up. */
```

```
matrix: P_P(4,4) = p44_P $
matrix: P_Plo(4,4) = p44_Plo $
matrix: P_Pphi(4,4) = p44_Pphi $
matrix: P_Pf(4,4) = p44_Pf $
matrix: P_Pflo(4,4) = p44_Pflo $
matrix: P_Pphi(4,4) = p44_Pphi $
calc: delete p44_P, p44_Plo, p44_Pphi $
calc: delete p44_f, p44_flo, p44_fhi $
```

Tab 73, p. 1

# produced by RJRTC in HUMPHREY

```

DMS500
DMS: Computation of present discounted value (PDV)
of 'past' non-FPD resolved and unresolved claims.
Input files: lv6; 'Risk Free Interest'
This version is used ms7a as input file.
Program modifies DM3
clear
proc drop _all
get msg off
set more off
set matsize 500
log using dm5_ms8a, replace

(0) Liquidated value of unresolved claims (based on TOP)
from [MatrixREV95.xls]Unresolved:
Matrix U = (AR400, 25400, 51500, 12500)
Matrix colnames U = LC NBID DBID PI
Matrix rownames U = LiqVal

(1) Administrative costs per claim from [MatrixREV95.xls]admin_costs
Matrix C = (577 \ 210)
Matrix rownames C = Past unres
Matrix colnames C = ad_cost
Matrix li C

(1) Compute discount factors
use Risk Free Interest Rate
Drop 1988-1991 (Courts' Preliminary Orders cover only 1992+)
drop in 1/4
qui gen n = 2000 - _n
sort n
gen dFactor = 1 in 1
qui replace dF = (dF[_n-1])*(1 + 1/100) in 2/9
form dF %9.3f
sort y
drop n 1

(2) Merge with lv6; incl. admin costs and unresolved claims
merge year using lv6
drop _m

Estimated Liquidated Values of Unresolved Claims
qui replace VR_LC = U[1,1] if y == 2000
qui replace VS_LC = U[1,1] if y == 2000
qui replace VR_NBID = U[1,2] if y == 2000
qui replace VS_NBID = U[1,2] if y == 2000
qui replace VR_DBID = U[1,3] if y == 2000
qui replace VS_DBID = U[1,3] if y == 2000
qui replace VR_PI = U[1,4] if y == 2000
qui replace VS_PI = U[1,4] if y == 2000

Add admin costs of past resolved claims to LiqVals
qui replace VR_LC = VR_LC + C[1,1] if y < 2000
qui replace VR_NBID = VR_NBID + C[1,1] if y < 2000
qui replace VR_DBID = VR_DBID + C[1,1] if y < 2000
qui replace VR_PI = VR_PI + C[1,1] if y < 2000
qui replace VS_LC = VS_LC + C[1,1] if y < 2000
qui replace VS_NBID = VS_NBID + C[1,1] if y < 2000
qui replace VS_DBID = VS_DBID + C[1,1] if y < 2000
qui replace VS_PI = VS_PI + C[1,1] if y < 2000

(4) Convert to matrices (Note: Order needs to be conformal with
order of rows in subdiagonal P-matrices in ms7a and ms7)
RICO
qui replace YR_LC = 0 if YR_LC == .
qui replace YR_NBID = 0 if YR_NBID == .
qui replace YR_DBID = 0 if YR_DBID == .
qui replace YR_PI = 0 if YR_PI == .
mksmat YR_LC
mksmat YR_NBID
mksmat YR_DBID
mksmat YR_PI
matrix YR = YR_LC, YR_DBID, YR_NBID, YR_PI
matrix drop YR_LC YR_NBID YR_DBID YR_PI
matrix colnames YR = LC DBID NBID PI
matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YR, format(88.0f) title("RICO Claims by Dx Year")

qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_PI = 0 if VR_PI == .
mksmat VR_LC
mksmat VR_NBID
mksmat VR_DBID
mksmat VR_PI
matrix VR = VR_LC, VR_DBID, VR_NBID, VR_PI
matrix drop VR_LC VR_NBID VR_DBID VR_PI
matrix colnames VR = LC DBID NBID PI
matrix rownames VR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VR, format(88.0f) title("RICO PDV LiqVal+AdmCost by Dx Year")

SFA
qui replace YS_LC = 0 if YS_LC == .
qui replace YS_NBID = 0 if YS_NBID == .
qui replace YS_DBID = 0 if YS_DBID == .
qui replace YS_PI = 0 if YS_PI == .
mksmat YS_LC
mksmat YS_NBID
mksmat YS_DBID
mksmat YS_PI
matrix YS = YS_LC, YS_DBID, YS_NBID, YS_PI
matrix drop YS_LC YS_NBID YS_DBID YS_PI
matrix colnames YS = LC DBID NBID PI

```

```
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YS, format(%8.0f) title('SFA Claims by Dx Year')
```

```
qui replace VS_LC = 0 if VS_LC == .
qui replace VS_NBID = 0 if VS_NBID == .
qui replace VS_DBID = 0 if VS_DBID == .
qui replace VS_P1 = 0 if VS_P1 == .
mkmat VS_LC
mkmat VS_DBID
mkmat VS_NBID
mkmat VS_P1
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_P1
matrix drop VS_LC VS_DBID VS_NBID VS_P1
matrix colnames VS = LC DBID NBID P1
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VS, format(%8.0f) title('SFA PDV LiqVal+AdmCost by Dx Year')
```

```
* (4) Get P-matrix from ms7a
* Note: This file has a slightly format than cml (as used in ms7a)
```

```
drop _all
use `ms7a_R2`
* Use ONLY 'best' estimates of P-matrix
keep if Era == 0
l.nod
* Loop through (low,med,high) (n = 1,2,3)
qui gen double PDV_RICO = .
qui gen double PDV_SFA = .
form PDV* %9.1f
prog def getPDV
matrix P = J(4,4,0)
```

```
global n = 1
while %n <= 3 {
matrix P(1,1) = p11[%n]
matrix P(2,1) = p21[%n]
matrix P(2,2) = p22[%n]
matrix P(3,1) = p31[%n]
matrix P(3,2) = p32[%n]
matrix P(3,3) = p33[%n]
matrix P(4,1) = p41[%n]
matrix P(4,2) = p42[%n]
matrix P(4,3) = p43[%n]
matrix P(4,4) = p44[%n]
di "case: ", %n
matrix li P
* Compute PDV for both RICO & SFA
matrix DR = trace(VR * (I(4) - P) * YR')
qui replace PDV_RICO = DR(1,1)/1e6 in %n
matrix DS = trace(VS * (I(4) - P) * YS')
qui replace PDV_SFA = DS(1,1)/1e6 in %n
}
```

```
* Save results in median case (n=2) for graphs and tables
if %n == 2 {
* FR and FS are annual financial injury from RICO and SFA
matrix FR = vecdiag(VR * (I(4) - P) * YR')
matrix FS = vecdiag(VS * (I(4) - P) * YS')
matrix FR = FR'
matrix FS = FS'
* ZR and ZS are annual claims by Dx in counterfactual scenario (median case)
matrix ZR = P * YR'
matrix ZS = P * YS'
matrix ZR = ZR'
matrix ZS = ZS'
}
```

```
global n = %n
l * %n = %n
}
```

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```

* (0) Liquidated value of unresolved claims (based on TDP)
* from [MatrixREV95.xls]Unresolved:
matrix U = (P400, 25400, 51500, 12500)
matrix colnames U = LC NBID DBID P1
matrix rownames U = LiqVal

* Administrative costs per claim from [MatrixREV95.xls]admin_costs
matrix C = (577 \ 210)
matrix rownames C = past unres
matrix colnames C = ad_cost
matrix li C
matrix C[2,1]
ad_cost
past 577
unres 210

* (1) Compute discount factors
use Risk Free Interest Rate

* Drop 1948-1991 (Courts' Preliminary Orders cover only 1992+)
drop in 1/4
(4 observations deleted)

qui gen n = 2000 - _n
sort n
gen dFactor = 1 in 1
(4 missing values generated)
qui replace dF = dF[_n-1] * (1 + 1/100) in 2/9
form dF v9.3:
sort y
drop n 1
1

Year dFactor
1. 1992 1.418
2. 1993 1.370
3. 1994 1.331
4. 1995 1.281
5. 1996 1.213
6. 1997 1.153
7. 1998 1.096
8. 1999 1.045
9. 2000 1.000

* (2) Merge with lv6; incl. admin costs and unresolved claims
merge year using lv6

* (3) Compute PDV of Liq Val + Admin Costs by Dx and Year
qui replace VR_LC = VR_LC * dF
qui replace VR_NBID = VR_NBID * dF
qui replace VR_DBID = VR_DBID * dF

```

```

. drop _m
. qui replace VR_NBID = U[1,2] if y == 2000
. qui replace VS_NBID = U[1,2] if y == 2000
. qui replace VR_DBID = U[1,3] if y == 2000
. qui replace VS_DBID = U[1,3] if y == 2000
. qui replace VR_PL = U[1,4] if y == 2000
. qui replace VS_PL = U[1,4] if y == 2000

```

```

* Add admin costs of past resolved claims to LiqVals
. qui replace VR_LC = VR_LC + C[1,1] if y < 2000
. qui replace VR_NBID = VR_NBID + C[1,1] if y < 2000
. qui replace VR_DBID = VR_DBID + C[1,1] if y < 2000
. qui replace VR_PL = VR_PL + C[1,1] if y < 2000
. qui replace VS_LC = VS_LC + C[1,1] if y < 2000
. qui replace VS_NBID = VS_NBID + C[1,1] if y < 2000
. qui replace VS_DBID = VS_DBID + C[1,1] if y < 2000
. qui replace VS_PL = VS_PL + C[1,1] if y < 2000

* Add admin costs to unresolved claims to LiqVals
. qui replace VR_LC = VR_LC + C[2,1] if y == 2000
. qui replace VR_NBID = VR_NBID + C[2,1] if y == 2000
. qui replace VR_DBID = VR_DBID + C[2,1] if y == 2000
. qui replace VR_PL = VR_PL + C[2,1] if y == 2000
. qui replace VS_LC = VS_LC + C[2,1] if y == 2000
. qui replace VS_NBID = VS_NBID + C[2,1] if y == 2000
. qui replace VS_DBID = VS_DBID + C[2,1] if y == 2000
. qui replace VS_PL = VS_PL + C[2,1] if y == 2000

```

```

qui replace VR_P1 = VR_P1 * dF
qui replace VS_LC = VS_LC * dF
qui replace VS_NBID = VS_NBID * dF
qui replace VS_DBID = VS_DBID * dF
qui replace VS_P1 = VS_P1 * dF
drop dF

```

```

* (4) Convert to matrices (Note: Order needs to be conformal with
order of rows in subdiagonal P-matrices in ms7a and ms7)

```

```

* RICO
qui replace YR_LC = 0 if YR_LC == .
qui replace YR_NBID = 0 if YR_NBID == .
qui replace YR_DBID = 0 if YR_DBID == .
qui replace YR_P1 = 0 if YR_P1 == .

```

```
mkmat YR_LC
```

```
mkmat YR_NBID
```

```
mkmat YR_DBID
```

```
mkmat YR_P1
```

```
matrix YR = YR_LC, YR_DBID, YR_NBID, YR_P1
```

```
matrix drop YR_LC YR_NBID YR_DBID YR_P1
```

```
matrix colnames YR = LC DBID NBID P1
```

```
matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
```

```
matrix li YR, format(%8.0f) title("RICO Claims by Dx Year")
```

```

YR[9,4]: RICO Claims by Dx Year
LC DBID NBID P1
1992 0 0 0 0
1993 0 0 0 0
1994 0 0 0 0
1995 0 0 0 0
1996 460 14 50 41
1997 852 601 1165 1024
1998 1408 2386 3823 3811
1999 2265 16423 24116 8291
2000 2960 13359 24575 10674

```

```

qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_P1 = 0 if VR_P1 == .

```

```
mkmat VR_LC
```

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produced by RJRTC

```

mkmat VR_NBID
mkmat VR_DBID
mkmat VR_P1
matrix VR = VR_LC, VR_DBID, VR_NBID, VR_P1
matrix drop VR_LC VR_NBID VR_DBID VR_P1

```

```
matrix colnames VR = LC DBID NBID P1
```

```
matrix rownames VR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
```

```
matrix li VR, format(%8.0f) title("RICO PDV LiqVal+AdmCost by Dx Year")
```

```

VR[9,4]: RICO PDV LiqVal+AdmCost by Dx Year
LC DBID NBID P1
1992 0 0 0 0
1993 0 0 0 0
1994 0 0 0 0
1995 0 0 0 0
1996 106213 61370 31035 15261
1997 101419 58751 29730 14549
1998 96865 55924 28138 13853
1999 92414 52990 26774 12980
2000 88610 51710 25610 12710

```

```

* SFA
qui replace YS_LC = 0 if YS_LC == .
qui replace YS_NBID = 0 if YS_NBID == .
qui replace YS_DBID = 0 if YS_DBID == .
qui replace YS_P1 = 0 if YS_P1 == .

```

```
mkmat YS_LC
```

```
mkmat YS_NBID
```

```
mkmat YS_DBID
```

```
mkmat YS_P1
```

```
matrix YS = YS_LC, YS_DBID, YS_NBID, YS_P1
```

```
matrix drop YS_LC YS_NBID YS_DBID YS_P1
```

```
matrix colnames YS = LC DBID NBID P1
```

```
matrix rownames YS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
```

```
matrix li YS, format(%8.0f) title("SFA Claims by Dx Year")
```

```

YS[9,4]: SFA Claims by Dx Year
LC DBID NBID P1
1992 14 1 0 0
1993 17 2 0 0
1994 555 6 3 0
1995 933 44 30 21
1996 1612 1003 3356 3722
1997 2405 4262 7262 5453

```



```

1998 2111 3967 6992 5907
1999 2653 22284 35603 12023
2000 2585 20135 30318 13653

```

```

. qui replace VS_LC = 0 if VS_LC ==
. qui replace VS_NBID = 0 if VS_NBID ==

```

```

. qui replace VS_DBID = 0 if VS_DBID ==
. qui replace VS_P1 = 0 if VS_P1 ==

```

```
mkmat VS_LC
```

```
mkmat VS_DBID
```

```
mkmat VS_NBID
```

```
mkmat VS_P1
```

```
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_P1
```

```
matrix drop VS_LC VS_NBID VS_DBID VS_P1
```

```
matrix columnnames VS = LC DBID NBID P1
```

```
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
```

```
matrix li VS, format(%8.0%) title("SFA PDV LiqVal*AdmCost by Dx Year")
```

```
VS[9,4]: SFA PDV LiqVal*AdmCost by Dx Year
```

	LC	DBID	NBID	P1
1992	159788	71719	818	818
1993	131377	69287	790	790
1994	115516	72882	34051	768
1995	113591	69612	33136	16613
1996	106310	62012	31374	15464
1997	101889	59178	30011	14811
1998	97037	56279	28231	13909
1999	92715	52772	26779	12661
2000	88610	51710	25610	12710

```
. (4) Get P-matrix from ms7a
```

```
. Note: This file has a slightly format than crl (as used in dm3)
```

```
drop _all
```

```
use msRa_R2
```

```
. Use only 'past' estimates of P-matrix
```

```
. keep if Era == 0
```

```
(3 observations deleted)
```

```
. l nod
```

	Era	Range	p11	p21	p31	p32
>	p33	p41	p42	p43	p44	
>	1.	Past	0.8880	0.0365	0.9577	0.0217
>		Lo	0.0174	0.0160	1.0000	0.0217
>	2.	Past	0.9754	0.0195	0.0174	0.0217
>		Med	0.8880	0.0365	0.9577	0.0217
>	3.	Past	0.9754	0.0195	0.0174	0.0217
>		Hi	0.8880	0.0365	0.9577	0.0217
>			0.9754	0.0195	0.0174	0.0217

produced by R2RTC

in HUMPHREY

```

. * Loop through (low,med,high) (n = 1,2,3)
. qui gen double PDV_RICO =
. qui gen double PDV_SFA =
. * Save results in median case (n=2) for graphs and tables
. if Sn == 2 (
. * FR and FS are annual financial injury from RICO and SFA
. matrix FR = vecdiag(VR * (I(4) - P) * YR')
. matrix FS = vecdiag(VS * (I(4) - P) * YS')
. matrix FR = FR'
. matrix FS = FS'
. * ZR and ZS are annual claims by Dx in counterfactual scenario (median cas
> e)
. matrix ZR = P * YR'
. matrix ZS = P * YS'
. matrix ZR = ZR'
. matrix ZS = ZS'
. )
. global n = Sn + 1
. )
. getPDV
case: 1
P[4,4]
r1 .88800001 c1 c2 c3 c4
r2 .0365 .95770001 0 0
r3 .0482 .0217 .97539997 0
r4 .0195 .0174 .016 1
case: 2
P[4,4]
r1 .88800001 c1 c2 c3 c4
r2 .0365 .95770001 0 0
r3 .0482 .0217 .97539997 0

```

```
r4 .0195 .0174 .016 1
Case: 3
```

```
P(4.4)
```

```
r1 .RRR0001 c1 c2 c3
r2 .0365 .95770001 0 0
r3 .0482 .0217 .97539997 0
r4 .0195 .0174 .016 1
```

```
1 Era Range PDV_R PDV_SFPA
```

```
1. Past Lo 128.7 214.1
2. Past Med 128.7 214.1
3. Past Hi 128.7 214.1
```

```
* Display results for median case for graphs and tables
drop _all
```

```
* Financial injury by year
```

```
svmat fr
number of observations will be reset to 9
Press any key to continue, or Break to abort
obs was 0, now 9
```

```
svmat FS
```

```
qui replace FR = FR/le6
```

```
qui replace FS = FS/le6
```

```
gen int year = _n * 1991
```

```
svmat ZR
```

```
ren ZR1 ZR_LC
```

```
ren ZR2 ZR_DBID
```

```
ren ZR3 ZR_NBID
```

```
ren ZR4 ZR_P1
```

```
svmat ZS
```

```
ren ZS1 ZS_LC
```

```
ren ZS2 ZS_DBID
```

```
ren ZS3 ZS_NBID
```

```
ren ZS4 ZS_P1
```

```
order y FR FS ZR* ZS*
```

```
format %20s YR.01
```

```
ly F*.nod
```

```
year FRI FSI
1. 1992 0 0
2. 1993 0 0
```

552614 0788

25

produced by RJRTC

```
ly F*.nod
```

HUMPHREY

YEAR	ZR_LC	ZR_DBID	ZR_NBID	ZR_P1	ZS_LC	ZS_DBID	ZS_
1992	0	0	0	0	12	1	1
1993	0	0	0	0	15	3	3
1994	0	0	0	0	493	26	26
1995	1	0	0	0	829	76	76
1996	1	0	0	0	1431	1019	1019
1997	3825	607	1190	1070	2136	4170	4170
1998	5690	1250	2336	3941	1875	3876	3876
1999	6129	2011	15811	23988	2356	21438	3
2000	13032	2628	14817	24446	3272	19418	3
0187	14560						

```
* save Claims_P.replace
(Note: file Claims_P.dta not found)
file Claims_P.dta saved
```

```
* log close
```

go to:

tab 73, p.3

(formatted)

WEW 3, p.4, p.14

Water charges:

- remove asbestos - specific quit rate effect (see p.5, 10 this tab)

R2 3.0 → 1.0

future  
past

nir5\_r2.do

ORW500

```
nir5: BL-CF differences in proportion of ever-smokers and
mean smoke-years exposure of claimants in HRA audit files
Relative risk initiation model hC(t) = e^{SB(t)} if year >= T1
hC(t) = r2*SB(t) if year >= T2, where T1 = T2
hC(t) = r3*SB(t) if year >= T3, where T1 = T2
(R) can be any value, not just 1; T3 can be any value, not just 1999
Age distribution for future claimants from age9.dta
Baseline cumulative smoking initiation curve from nir3.dta
crossover insurers excluded
```

Scenario	pre-RR misconduct	Estimate	r1	r2	r3
BL	-	-	1.0	1.0	1.0
CF	yes	low	1.0	0.8	1.0
CF	yes	mid	0.9	0.7	1.0
CF	yes	high	0.8	0.5	1.0

```
clear
set obs 200
drop _all
set rmsg off
set more off
set matsize 200
```

```
log using nir5, replace
```

```
* (1) get distribution of birth year of all claimants from age9.dta
```

```
use age9
keep year AllFutur
matrix pi = year.AllFutur
matrix drop year AllFutur
* m = number of rows of pi
* col 1 (year t), col 2 pi(t)
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi
```

```
* No correction here for year first exposed to asbestos
* (Comparison of output of nir2 and nir3 shows little effect)
```

```
* (2) Get baseline cumulative initiation curve from nir3.dta
```

```
drop _all
use nir3_r2
gen SB = 1 - FB
lab var x "Age"
```

```
* (3) Computation of initiation rates in CF scenario
```

```
Cutoff years for decrease in initiation rates are $T1, max($T2, Y1exp), max($T3, Y1exp)
Relative decrease in initiation rate (on or after year T1) is global variable $r1
Relative decrease in initiation rate (on or after max($T2, Y1exp)) is global variable $r2
Relative decrease in initiation rate (on or after max($T3, Y1exp)) is global variable $r3
```

```
* SB(x) cumulative proportion, not smoking through age x in BL scenario.
```

```
keep x SB
sort x
order x SB
* Set xMax
* Age 50 set as cutoff for ever smoking
global xMax = 50
drop if x > $xMax
qui sum x
global xMin = r(min)
```

```
global N = _N
```

```
* Lifetime probability of not smoking by age $xMax in BL scenario
global PB = SB($xMax)
* Initiation survival curve in BL scenario
* gen SB = 1 - (1 - PB)^x
* Mean age started among those starting by age $xMax in BL scenario
global XB = $xMin + r(mean)*$N
* Probability of not smoking (by age $xMax) = ".17.3f $PB
* Mean age started (among those starting by age $xMax) = ".17.1f $XB
```

```
* SBR3 = SB(x)^r3; SBR2 = SB(x)^r2; SBR1 = SB(x)^r1
```

```
qui gen SBR1 =
```

```
qui gen SBR2 =
```

```
qui gen SBR3 =
```

```
prog _g_sbr
```

```
* $_1 = T1; $_2 = T2; $_3 = T3; $_4 = r1; $_5 = r2; $_6 = r3
global T1 = $_1
global T2 = $_2
global T3 = $_3
global r1 = $_4
global r2 = $_5
global r3 = $_6
```

```
* Check T3 > T2 > T1
if $T2 <= $T1 | $T3 <= $T2 {
    di "Invalid ".99.0f $T1,$T2,$T3
    exit
}
```

```
* Compute SB(x)^r1 SB(x)^r2 SB(x)^r3
```

```
qui replace SBR1 = SB^$r1
```

```
qui replace SBR2 = SB^$r2
```

```
qui replace SBR3 = SB^$r3
```

```
qui replace SC = 0
```

```
* Compute SC = SUM(t) pi(t)*SB(x)^r2*SB(min(x,T1-t))^(1-r1)*SB(min(x,T2-t))^(r1-r2)*SB(mi
```

```
n(x,T3-t))^(r2-r3) for all x
```

```
* Sum over index 'i' (rows of pi)
```

```
local i = 1
```

```
while 'i' <= $m {
```

```
    local t = pi['i',1]
```

```
    local p = pi['i',2]
```

```
    * 'x1' = age at T1
```

```
    local x1 = $T1 - 't'
```

```
    * 'x2' = age at T2
```

```
    local x2 = min($T2 - 't', $xMax)
```

```
    * 'x3' = age at T3
```

```
    local x3 = min($T3 - 't', $xMax)
```

```
    * Note: x3 >= x2 >= x1
```

```
    * 'v1' = obs# at age at T1
```

```
    local v1 = 'x1' - $xMin
```

```
    * 'v2' = obs# at age at T2
```

```
    local v2 = 'x2' - $xMin
```

```
    * 'v3' = obs# at age at T3
```

```
    local v3 = 'x3' - $xMin
```

```
    * Note: u3 >= u2 >= u1
```

```
    local A1 = SB['u1']^(1-$r1)
```

```
    local A2 = SB['u2']^(1-$r1)
```

```
    local A3 = SB['u3']^(1-$r1)
```

```
    local A4 = SB['u4']^(1-$r1)
```

```
    local A5 = SB['u5']^(1-$r1)
```

```
    local A6 = SB['u6']^(1-$r1)
```

```
    local A7 = SB['u7']^(1-$r1)
```

```
    local A8 = SB['u8']^(1-$r1)
```

```
    local A9 = SB['u9']^(1-$r1)
```

```
    local A10 = SB['u10']^(1-$r1)
```

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<http://legacy.library.ucsf.edu/study/q07a00/pdf> [www.industrydocuments.ucsf.edu/docs/ffgl0001](http://www.industrydocuments.ucsf.edu/docs/ffgl0001)

nir5\_r2.do

```
prog def Results
di "----" Decrease in proportion smoked "----"
di "Post-2000" Low Middle High
di "Misconduct" Est. Est. Est.
di "Yes" ".12.3f FB(SN) - PC71o(SN) .12.3f FB(SN) .12.3f FB(SN) .12.3f FB(SN)
) di "No" ".12.3f FB(SN) - FC_1o(SN) .12.3f FB(SN) .12.3f FB(SN) .12.3f FB(SN)
```

```
end
Results
log close
quit _rc=0
```

Produced by RJRTC  
in  
HUMPHREY

```
* (1) get distribution of birth year of all claimants from age9.dta
```

```
use age9
```

```
keep year AllFutur
```

```
mksmat year AllFutur
```

```
matrix pi = year.AllFutur
```

```
matrix drop year AllFutur
```

```
* m = number of rows of pi
```

```
* col 1 (year t), col 2(pi(t))
```

```
matrix colnames pi = t pi(t)
```

```
global m = rowsof(pi)
```

```
matrix list pi
```

```
pi[72,]
```

```

t      pi(t)
11 1900 .00004113
12 1901 .00002101
13 1902 .00003102
14 1903 .00004534
15 1904 .00006574
16 1905 .00009443
17 1906 .00013421
18 1907 .00018484
19 1908 .00026279
20 1909 .00046174
21 1910 .00049251
22 1911 .00066282
23 1912 .00088162
24 1913 .00115474
25 1914 .00150459
26 1915 .00192976
27 1916 .00244442
28 1917 .00305756
29 1918 .00377616
30 1919 .00460425
31 1920 .00554198
32 1921 .00658479
33 1922 .00773274
34 1923 .00894043
35 1924 .01021674
36 1925 .01152602
37 1926 .01283937
38 1927 .01415696
39 1928 .01536111
40 1929 .01652004
41 1930 .01759231
42 1931 .01858097
43 1932 .01950742
44 1933 .02041352
45 1934 .02136119
46 1935 .02242851
47 1936 .02370143
48 1937 .02526133
49 1938 .02716919
50 1939 .02944844
51 1940 .03206937
52 1941 .03493946

```

```

r43 1942 .03790151
r44 1943 .04074331
r45 1944 .04218114
r46 1945 .0451114
r47 1946 .0488816
r48 1947 .048812
r49 1948 .0453337
r50 1949 .04289862
r51 1950 .03982827
r52 1951 .03601309
r53 1952 .03170149
r54 1953 .02716146
r55 1954 .0226488
r56 1955 .01838121
r57 1956 .01452142
r58 1957 .01117046
r59 1958 .00817014
r60 1959 .00611017
r61 1960 .00431125
r62 1961 .00301161
r63 1962 .0020111
r64 1963 .00137566
r65 1964 .00090207
r66 1965 .00058381
r67 1966 .00037486
r68 1967 .0002404
r69 1968 .00015518
r70 1969 .00010166
r71 1970 .0000681
r72 1971 .00017831

```

```

* No correction here for year first exposed to asbestos
* (Comparison of output of nit2 and nir3 shows little effect)

```

```

* (2) Get baseline cumulative initiation curve from nir3.dta
drop _all

```

```
use nir3_r2
```

```
gen SB = 1 - FB
```

```
lab var x "Age"
```

```

* (3) Computation of initiation rates in CF scenario
* Cutoff years for decrease in initiation rates are $T1, max($T2, Y1exp), max(
> $T3, Y1exp)
* Relative decrease in initiation rate (on or after year T1) is global variab
> le $r1
* Relative decrease in initiation rate (on or after max($T2, Y1exp)) is global
> variable $r2
* Relative decrease in initiation rate (on or after max($T3, Y1exp)) is global
> variable $r3
* SB(x) cumulative proportion not smoking through age x in BL scenario.
keep x SB
sort x
order x SB
* Set xMax
* Age 50 set as cutoff for ever smoking
global xMax = 50

```

nir5.log

```
... drop if x > 5xMax
(0 observations deleted)
```

qui sum x

```
global xmin = r'(min)
```

$$N_{\text{global}} = N_{\text{req}} + N_{\text{res}}$$

- lifetime probability of not smoking by age 5xMax in 9L scenario

$$\text{global } r_B = \text{SB}[\$N]$$

\* Conditional survival curve in BL scenario

$$\text{and } \text{BS} = 1 - (1 - \text{BS}) / (1 - \text{BS} - 1) = \text{BS}$$

was in

```

* Mean age started among those starting by age $XMax in $S
global XB = $XMin + r(mean)*$N

```

all - probability of not smoking (by age 50) = 0.243

$$d1 = \text{Mean age started (among those starting by age } \$x_{\text{Max}}) = 20.7$$

drop as

$$= \{SBS\} = \{SBS(x)^{\wedge_1}, SBS(x)^{\wedge_2}\}; \quad SBS = SBS(x)^{\wedge_1}$$

qui gen SBr1 = .

ui gen src = .

qui gen SAR3 :

quien sea = .

257ab fep bo:ca

```

prog def getSC
1.1. s_1 = T1; s_2 = T2; s_3 = T3; s_4 = r1; s_5 = r2; s_6 = r3
    global T1 = s_1

```

7-11-1968

$$\sigma_{\text{global}}^2 = 5.7$$
$$\text{global } \tau_3 = \tau_3$$

```
global r1 = 5_4
```

global 1 3 5 6  
global 1 3 5 6

- Check  $T3 > T2 > T1$

```

if $T2 <= $T1 | $T3 <= $T2 {
R      di "Invalid %.09.0f $T1,$T2,$T3

```

exit

—

$$\mathbf{E}_1(x) \mathbf{B}_1(x) \mathbf{H}_1(x) = \mathbf{E}_2(x) \mathbf{B}_2(x) \mathbf{H}_2(x)$$

175,85 = 1285 replace inv

275.85 = 2785 replaced by

qui replace 58r3 =

```

qui replace sc = 0
* compute sc = sum(r) ni(t)*sa(x)^2*sb(min(x,t1-t))^(1-r1)*sb(min(x,t2-t))

```

$$(r1-r2) * \sin(\min(x, t3-t)) \wedge (r2-r3) \text{ for all } x$$

Sum over index 'i' (rows of pi)

```
local i = 1
```

```

15. while 'i' <= $m {
16.   local t = pi['i',1]
17.   local p = pi['i',2]
18.   'x1' = age at T1
19.   local u1 = t - $xMin
20.   'x2' = age at T2
21.   local x2 = min($x1, 'x2')
22.   'x3' = age at T3
23.   local x3 = min($T3 - 't', $xMax)
24.   Note: x3 >= x2 >= x1
25.   'v1' = obs# at age at T1
26.   local u1 = 'x1' - $xMin
27.   local v1 = 'x1' - $xMin + 1
28.   'v2' = obs# at age at T2
29.   local u2 = 'x2' - $xMin
30.   local v2 = 'x2' - $xMin + 1
31.   'v3' = obs# at age at T3
32.   local u3 = 'x3' - $xMin + 1
33.   Note: u3 >= u2 >= u1
34.   local A1 = $a['x1',1] - $xMin
35.   local A2 = $a['x2',1] - $xMin
36.   local A3 = $a['x3',1] - $xMin
37.   di 'i', 't', 'x1', 'x2', 'x3', 'x1', 'x2', 'x3', 'u1', 'u2', 'u3', 'v1', 'v2', 'v3'
38.   'u1' = 'u1'
39.   'u2' = 'u2'
40.   'u3' = 'u3'
41.   'v1' = 'v1'
42.   'v2' = 'v2'
43.   'v3' = 'v3'
44.   Null Case:
45.   if 'x1' >= $xMax {
46.     DEBUGGING
47.     di 'Null Case'
48.     qui replace SC = SC + 'p' * SB
49.   }
50.   else {
51.     if 'u3' <= 0 {
52.       Case A: 'u1' <= 0 & 'u2' <= 0 & 'u3' <= 0
53.       DEBUGGING
54.       di 'Case A'
55.       qui replace SC = SC + 'p' * SBr1
56.     }
57.     else {
58.       if 'u3' > 0 & 'u2' <= 0 {
59.         Case B:
60.         DEBUGGING
61.         di 'Case B'
62.         qui replace SC = SC + 'p' * SBr2
63.       }
64.       else {
65.         if 'u2' > 0 & 'u1' <= 0 {
66.           Case C:
67.           DEBUGGING
68.           di 'Case C'
69.           qui replace SC = SC + 'p' * SBr3
70.         }
71.         else {
72.           if 'v3' <= $N {
73.             Case D:
74.             DEBUGGING
75.             di 'Case D'
76.             qui replace SC = SC + 'p' * SBr4
77.           }
78.           else {
79.             if 'v2' <= 'u3' {
80.               Case E:
81.               DEBUGGING
82.               di 'Case E'
83.               qui replace SC = SC + 'p' * SBr5
84.             }
85.             else {
86.               if 'v1' <= 0 & 'u2' > 0 & 'u3' > 0
87.               DEBUGGING
88.               di 'Case F'
89.               qui replace SC = SC + 'p' * SBr6
90.             }
91.           }
92.         }
93.       }
94.     }
95.   }
96. }
97. }
98. }
99. }
100. }

```

Sum over INC

```

di "Case D"
  qui replace SC = SC * 'p' * SB in 1/'u1'
  qui replace SC = SC * 'p' * SBr1 * 'A1' in 1/'u2'
  if 'v2' <= 'u3' (
    qui replace SC = SC * 'p' * SBr2 * 'A2' in 1/'u3'
    qui replace SC = SC * 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'
  )
  if 'v3' <= SN (
    qui replace SC = SC * 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'
  )
  local i = 1
  do _do_
  69. )
  70. * Lifetime probability of not smoking by age $xMax in CF scenario
  71. global PC = SC(SN)
  72. tempvar SC_ = (1 - SC)/(1 - SPC)
  73. qui sum SC_
  74. * Mean age started among those starting by age $xMax in CF scenario
  75. global X = SxMin + r(mean)/SN
  76. di %7.0f STr1, %7.0f ST2, %7.0f ST3, %7.1f STr1, %7.1f STr2, %7.1f STr3, %7.3
  77. * SPC - SPr, %7.2f SPr - SPC
  78. end

```

```

* Plot of 1 range SC
1. di _T1_ T2 T3 r1 r2 r3 deltax
2. getSC 1954 1963 2001 1.0 1.0 1.0
3. getSC 1954 1963 2001 1.0 0.9 1.0
4. getSC 1954 1963 2001 1.0 0.8 1.0
5. qui gen FC_lo = 1 - SC
6. lab var FC_lo "FC (no post-2000 Misconduct) low est."
7. getSC 1954 1963 2001 1.0 0.8 0.8
8. qui gen FC7lo = 1 - SC
9. lab var FC7lo "FC (post-2000 Misconduct) low est."
10. getSC 1954 1963 2001 1.0 0.7 1.0
11. getSC 1954 1963 2001 1.0 0.6 1.0
12. getSC 1954 1963 2001 0.9 0.9 1.0
13. getSC 1954 1963 2001 0.9 0.8 1.0
14.
15.

```

```

*****Wecker Change: replace 0.7 with 1.0*****
getSC 1954 1963 2001 0.9 0.7 1.0
getSC 1954 1963 2001 0.9 1.0 1.0
*****End Wecker Change*****

```

```

16. qui gen FC_ = 1 - SC
17. lab var FC_ "FC (no post-2000 Misconduct) mid est."
18. getSC 1954 1963 2001 0.9 0.7 0.7
19. qui gen FC7 = 1 - SC
20. lab var FC7 "FC (post-2000 Misconduct) mid est."
21. getSC 1954 1963 2001 0.9 0.6 1.0
22. getSC 1954 1963 2001 0.8 0.8 1.0
23. getSC 1954 1963 2001 0.8 0.7 1.0
24. getSC 1954 1963 2001 0.8 0.6 1.0
25. qui gen FC_hi = 1 - SC
26. lab var FC_hi "FC (no post-2000 Misconduct) high est."

```

```

27. qui gen FC7hi = 1 - SC
28. lab var FC7hi "FC (post-2000 Misconduct) high est."

```

```

29. and
30. * Graph results for T1, T2 = 1954, 1963 r1, r2 = 0.9, 0.6 vs. T2 = 1988, r2 = 0.6
31. * gr FC_ "FB x.ylab(0.25..5..75.1)xlab(10,20,30,40,50)s(life(JJJ))l("Cumula
32. > tive Proportion Who Have Begun to Smoke")saving(nir5a.replace)
33.
34. * gr FC_ FC7 FB x.ylab(0.25..5..75.1)xlab(10,20,30,40,50)s(life(JJJ))l("Cumul
35. > ative Proportion Who Have Begun to Smoke")saving(nir5b.replace)
36.
37. keep x F*
38. form x %6.0f
39. form F* %7.3f
40.
41. save nir5_r2, replace
42. file nir5_r2.dta saved
43.
44. * List data
45. l, nod

```

	x	FC_lo	FC7lo	FC_	FC7	FC_hi	FC7hi	FB
1.	9	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.	10	0.022	0.022	0.021	0.021	0.019	0.019	0.022
3.	11	0.029	0.029	0.029	0.027	0.026	0.026	0.030
4.	12	0.040	0.040	0.040	0.038	0.036	0.036	0.041
5.	13	0.055	0.055	0.055	0.052	0.049	0.049	0.057
6.	14	0.080	0.080	0.080	0.078	0.070	0.070	0.083
7.	15	0.122	0.122	0.124	0.115	0.107	0.107	0.128
8.	16	0.186	0.186	0.190	0.174	0.162	0.162	0.196
9.	17	0.245	0.245	0.252	0.230	0.214	0.214	0.260
10.	18	0.326	0.326	0.337	0.305	0.284	0.284	0.347
11.	19	0.384	0.384	0.399	0.360	0.335	0.335	0.409
12.	20	0.454	0.454	0.474	0.427	0.397	0.397	0.485
13.	21	0.501	0.501	0.523	0.471	0.439	0.439	0.534
14.	22	0.529	0.529	0.554	0.498	0.465	0.465	0.565
15.	23	0.549	0.549	0.575	0.518	0.483	0.483	0.586
16.	24	0.568	0.568	0.595	0.535	0.499	0.499	0.605
17.	25	0.585	0.585	0.614	0.552	0.515	0.515	0.624
18.	26	0.600	0.600	0.630	0.566	0.529	0.529	0.640

```

qui gen FB = 1 - SB

```

```

* Graph results for T1, T2 = 1954, 1963 r1, r2 = 0.9, 0.6 vs. T2 = 1988, r2 = 0.6
gr FC_ "FB x.ylab(0.25..5..75.1)xlab(10,20,30,40,50)s(life(JJJ))l("Cumula
> tive Proportion Who Have Begun to Smoke")saving(nir5a.replace)

```

```

gr FC_ FC7 FB x.ylab(0.25..5..75.1)xlab(10,20,30,40,50)s(life(JJJ))l("Cumul
> ative Proportion Who Have Begun to Smoke")saving(nir5b.replace)

```

```

keep x F*

```

```

form x %6.0f

```

```

form F* %7.3f

```

```

save nir5_r2, replace
file nir5_r2.dta saved

```

```

* List data
l, nod

```

remove variables - specific  
initiation rate effect  
(future)



# IMPERY

19.	27	0.614	0.614	0.644	0.579	0.541	0.541	0.541	0.654
20.	28	0.622	0.622	0.654	0.588	0.549	0.549	0.664	0.654
21.	29	0.629	0.629	0.661	0.594	0.555	0.555	0.671	0.671
22.	30	0.641	0.641	0.674	0.604	0.565	0.565	0.684	0.684
23.	31	0.648	0.648	0.681	0.611	0.572	0.572	0.691	0.691
24.	32	0.655	0.655	0.689	0.618	0.579	0.579	0.698	0.698
25.	33	0.662	0.662	0.696	0.626	0.585	0.585	0.705	0.705
26.	34	0.669	0.669	0.704	0.633	0.593	0.593	0.713	0.713
27.	35	0.675	0.675	0.711	0.639	0.598	0.598	0.720	0.720
28.	36	0.679	0.679	0.715	0.643	0.602	0.602	0.724	0.724
29.	37	0.682	0.682	0.718	0.645	0.604	0.604	0.727	0.727
30.	38	0.685	0.685	0.722	0.649	0.608	0.608	0.730	0.730
31.	39	0.687	0.687	0.724	0.651	0.609	0.609	0.732	0.732
32.	40	0.695	0.695	0.732	0.658	0.616	0.616	0.740	0.740
33.	41	0.697	0.697	0.735	0.660	0.619	0.619	0.743	0.743
34.	42	0.699	0.699	0.736	0.662	0.620	0.620	0.744	0.744
35.	43	0.700	0.700	0.737	0.663	0.621	0.621	0.746	0.746
36.	44	0.701	0.701	0.739	0.664	0.622	0.622	0.747	0.747
37.	45	0.704	0.704	0.742	0.667	0.625	0.625	0.750	0.750
38.	46	0.706	0.706	0.744	0.669	0.627	0.627	0.752	0.752
39.	47	0.708	0.707	0.746	0.670	0.629	0.629	0.754	0.754
40.	48	0.708	0.707	0.746	0.670	0.629	0.629	0.754	0.754
41.	49	0.709	0.709	0.747	0.672	0.630	0.630	0.755	0.755
42.	50	0.711	0.711	0.749	0.674	0.633	0.633	0.757	0.757

Global N = 11

100  
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1

```

> play def Results
1. di "----"
2. di "Post_2000" Low Middle High
3. di "Misconduct" Est. Est. Est.
4. di "Yes" *12.3f FB[SN] - FC7lo[SN], *12.3f FB[SN] - FC7[SN], *12.3f FB[
5. di "No" *12.3f FB[SN] - FC1lo[SN], *12.3f FB[SN] - FC1[SN], *12.3f FB[
6. end

```

Results	Decrease in proportion smoked					
	Post-2000		Low		Middle	
	Est.	Std. Est.	Est.	Std. Est.	Est.	Std. Est.
Nonconduct	0.046	0.046	0.083	0.083	0.126	0.126
Yes	0.046	0.046	0.008	0.008	0.124	0.124
No						

log close

```

* nir6: BL-CF differences in proportion of ever-smokers and
* mean smoke years exposure of claimants in HRA audit files
* Relative risk initiation model hC(t) = r2*hb(t) if year >= T2, where
* hC(t) = r2*hb(t) if year >= T2, where
* hC(t) = r3*hb(t) if year >= T3, where
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)
* T2 = max(T2,y1exp), T3 = max(T3,y1exp); Relative reduction r2 in
* initiation rate begins only after start of employment/exposure to asbestos

```

```

* R4500

```

```

* Crossover: insulators excluded
* Scenario pre-RR misconduct Estimate r1 r2 r3

```

```

* BL - 1.0 1.0 1.0

```

```

* CF yes low 1.0 0.8 1.0

```

```

* CF mid 0.9 0.7 1.0

```

```

* CF yes high 0.8 0.6 1.0

```

```

* Input files: (nir) concatenated HRA audit samples (from nir)

```

```

* clear

```

```

* prog drop_all

```

```

* set msg off

```

```

* set more off

```

```

* set matsize 200

```

```

* log using nir6. replace

```

```

* use nir. clear

```

```

* (1) Save distribution of yrborn in Matrix pi(t)

```

```

* Exclude observations for which yrBegan was imputed in nir1.do

```

```

* drop if !begin == 0

```

```

* Exclude observations for which date of first exposure to asbestos unknown

```

```

* drop if y1exp == .

```

```

* tab yrborn [waw], matcell(pi) matrow(t_)

```

```

* matrix pi = pi_result(1)

```

```

* m = number of rows of pi

```

```

* col 1 (year t), col 2(pi(t))

```

```

* matrix colnames pi = t pi(t)

```

```

* global m = rowsof(pi)

```

```

* matrix drop t_

```

```

* Distribution of year of birth

```

```

* matrix list pi

```

```

* Tabulate year first exposed to asbestos

```

```

* tab y1exp [waw], missing

```

```

* qui gen byte smk_exp = yrBegin < y1exp

```

```

* lab var smk_exp "Began smoking before 1st employment with asbestos"

```

```

* tab smk_exp [waw]

```

```

* (2) Set up duration variable for initiation analysis

```

```

* gen int ageEnd = ageBegin

```

```

* replace ageEnd = yrDied - yrborn if ageEnd == .

```

```

* replace ageEnd = yrSett - yrborn if ageEnd == .

```

```

* replace ageEnd = yrRecv - yrborn if ageEnd == .

```

```

* gen byte smoked = Smoker == 1

```

```

* (3) Compute initiation survival curve

```

```

* stset ageEnd [waw], failure(Smoker) origin(time 0) scale(1) id(poc)

```

```

* sts generate SB = s

```

```

* form SB y19.jf

```

```

* gen byte x = _t

```

```

* lab var x "Age"

```

```

* gen FB = 1 - SB

```

```


```

```

form FB y19.jf
lab var FB "Cumul prop started smoking (BL)"

```

```

* set x

```

```

* drop if x == x[_N]

```

```

* global N = _N + 1

```

```

* qui sum x

```

```

* global xMin = r(min) - 1

```

```

* replace x = $xMin in $N

```

```

* replace FB = 0. in $N

```

```

* replace SB = 1. in $N

```

```

* set x

```

```

* form FB y19.0g

```

```

* if FB% if x<=50, xlab(10.15.20.25.30.35.40.45.50)y1ab(0.25.5.75.1)s(1)c(1)saving(nir3

```

```

a.replace)

```

```

form FB y19.jf

```

```

* (4) Relative decrease in initiation rates in CF scenario

```

```

* Cutoff years of decrease in initiation rates are $T1 and max($T2,y1exp)

```

```

* Relative decrease in initiation rate (on or after year T1) is global variable $r1

```

```

* Relative decrease in initiation rate (on or after max($T2,y1exp) ) is global variable $r

```

```

2

```

```

* Relative decrease in initiation rate (on or after max($T3,y1exp) ) is global variable $r

```

```

3

```

```

* SB(x) cumulative proportion not smoking through age x in BL scenario.

```

```

keep SB x y1exp

```

```

sort x

```

```

order x SB

```

```

* Set xMax

```

```

* Age 50 set as cutoff for ever smoking

```

```

global xMax = 50

```

```

drop if x > $xMax

```

```

qui sum x

```

```

global xMin = r(min)

```

```

global N = _N

```

```

* Lifetime probability of not smoking by age $xMax in BL scenario

```

```

global PB = SB($xMax)

```

```

* Conditional survival curve in BL scenario

```

```

qui gen SB_ = 1 - (1 - SB)/(1 - $PB)

```

```

* Mean age started among those starting by age $xMax in BL scenario

```

```

global XB = $xMin + r(mean)*$N

```

```

di "Probability of not smoking (by age $xMax) = ", $PB

```

```

di "Mean age started (among those starting by age $xMax) = ", $XB

```

```

drop SB_

```

```

* SBx3 = SB(x)^T3; SBx2 = SB(x)^T2; SBx1 = SB(x)^T1

```

```

qui gen SBx1 = .

```

```

qui gen SBx2 = .

```

```

qui gen SBx3 = .

```

```

gen SC = .

```

```

prog def getSC

```

```

* $_1 = T1; $_2 = T2; $_3 = T3; $_4 = T4; $_5 = T5; $_6 = T6

```

```

global T1 = $_1

```

```

global T2 = $_2

```

```

global T3 = $_3

```

```

global T4 = $_4

```

```

global T5 = $_5

```

```

global T6 = $_6

```

[illegible]

nir6\_r2.do

```
****Wecker Change: replace 0.7 with 1.0*****
getSC 1954 1963 2001 0.9 0.7 1.0
getSC 1954 1963 2001 0.9 1.0 1.0
*****End Wecker Change*****
```

```
qui gen FC = 1 - SC
lab var FC - FC (no post-2000 Misconduct) mid est..
getSC 1954 1963 2001 0.9 0.7 0.7
lab var FC7 = 1 - SC
getSC 1954 1963 2001 0.9 0.7 0.7
lab var FC7 - FC (post-2000 Misconduct) mid est..
getSC 1954 1963 2001 0.9 0.6 1.0
getSC 1954 1963 2001 0.8 0.8 1.0
qui gen FC_hi = 1 - SC
lab var FC_hi - FC (no post-2000 Misconduct) high est..
qui gen FC7hi = 1 - SC
lab var FC7hi - FC (post-2000 Misconduct) high est..
```

\*\*\*\*

```
rangeSC
qui gen FB = 1 - SC
* Graph results for T1,T2 = 1954,1963 r1,r2 = 0.9,0.6 vs. T2 = 1988, r2 = 0.6
* Global N = N
* Baseline scenario:
* List date
* Compute changes in proportion who ever smoked
* Decrease in proportion smoked
* Misconduct: Low Est. Middle High
* di - Yes . . . . . 112.3f FB(SN) - FC7lo(SN), 112.3f FB(SN) - FC7lo(SN), 112.3f FB(SN) - FC7lo(SN)
* di - No . . . . . 112.3f FB(SN) - FC7hi(SN), 112.3f FB(SN) - FC7hi(SN), 112.3f FB(SN) - FC7hi(SN)
* end
Results
log close
*032
```

Produced by RJRTC  
in  
HUMPHREY

use nlr, clear

\* (1) Save distribution of yrborn in matrix  
\* Exclude observations for which yrborn is missing  
drop if !begin == 0  
(193 observations deleted)

\* Exclude observations for which date of first exposure to asbestos unknown  
drop if Ylexp == .  
(47 observations deleted)

qui tab yrborn [w=w], matcell(pi) matrow(t\_)

matrix pi = pi/\_result(1)

matrix pi = t\_ pi

\* m = number of rows of pi  
\* col 1 (year t), col 2(pi(t))  
matrix colnames pi = t pi(t)

global m = rows-1(pi)

matrix drop t\_

\* Distribution of year of birth

matrix lis: pi

pi[64,2]

t	pi(t)
1895	.00018528
1897	.00014319
1898	.0001936
1900	.00061647
1901	.0011331
1902	.00016957
1903	.00113415
1904	.00061443
1905	.00281819
1906	.00322298
1907	.00449854
1908	.00365987
1909	.00763218
1910	.00601509
1911	.00871055
1912	.00815244
1913	.0137759
1914	.01685662
1915	.01611698
1916	.01891755
1917	.02051612
1918	.02706036
1919	.02981462
1920	.03726175
1921	.03644682
1922	.03416953
1923	.03654592
1924	.03229662
1925	.04102194
1926	.03281913
1927	.04087059
1928	.04231479
1929	.0247420

\* Tabulate year first exposed to asbestos  
\* tab Ylexp [w=w], missing  
(frequency weights assumed)

Year 1st Exposed to Asbestos	Freq.	Percent	Cum.
1912	986	0.00	0.00
1916	290	0.00	0.00
1920	40840	0.14	0.14
1921	3110	0.01	0.15
1922	19809	0.07	0.22
1923	56285	0.19	0.41
1924	6718	0.03	0.44
1925	36357	0.12	0.56
1926	23378	0.08	0.64
1927	19837	0.07	0.70
1928	42169	0.14	0.84
1929	39256	0.13	0.98
1930	34287	0.12	1.09
1931	57118	0.19	1.28
1932	34116	0.11	1.40
1933	101397	0.34	1.74
1934	109712	0.37	2.11
1935	198040	0.66	2.77
1936	271812	0.91	3.68
1937	323316	1.09	4.77
1938	264281	0.89	5.66
1939	421068	1.41	7.07
1940	999414	3.35	10.42
1941	1236684	4.15	14.57

$$\text{global } x_{\text{Min}} = r(\text{min}) - 1$$

```

. replace x = SxMin in SN
(1 real change made)

. replace FB = 0. in SN
(1 real change made)

. replace SB = 1. in SN
(1 real change made)

. sort x

. form FB %9.0g

. qf FB x if x<=50, xlab(0,15,20,25,30,35,40,45,50)ylab(0,.25,.5,.75,1)st(i)c(j)
. saving(nir3a,replace)

. form FB %9.3f

1 x FB if x<=50
1. 9 0.000
2. 10 0.022
3. 11 0.030
4. 12 0.041
5. 13 0.057
6. 14 0.083
7. 15 0.128
8. 16 0.196
9. 17 0.260
10. 18 0.347
11. 19 0.409
12. 20 0.485
13. 21 0.534
14. 22 0.565
15. 23 0.586
16. 24 0.605
17. 25 0.624
18. 26 0.640
19. 27 0.654
20. 28 0.664
21. 29 0.671
22. 30 0.684
23. 31 0.691
24. 32 0.698
25. 33 0.705
26. 34 0.713
27. 35 0.720
28. 36 0.724
29. 37 0.727
30. 38 0.730
31. 39 0.732
32. 40 0.740
33. 41 0.743
34. 42 0.744
35. 43 0.746
36. 44 0.747
37. 45 0.750
38. 46 0.752
39. 47 0.754
40. 48 0.754
41. 49 0.755
42. 50 0.757

. (4) Computation of initiation rates in CF scenario
. Cutoff years for decrease in initiation rates are S1 and max(S2,Y1exp)
. Relative decrease in initiation rate (on or after year T1) is global variab
le S1
. Relative decrease in initiation rate (on or after max(T2,Y1exp)) is global
variable S2
. Relative decrease in initiation rate (on or after max(T3,Y1exp)) is global
variable S3
. SB(x) cumulative proportion not smoking through age x in BL scenario.
. keep SB x Y1exp
. mean x
. order x SB
. t max
. Relative decrease in initiation rate for ever smoking
. global max
. drop if x > SxMax
(44 observations deleted)
. qui sum x
. global xMin = r(min)
. global N = _N
. Lifetime probability of not smoking by age SxMax in BL scenario
. global PB = SB(SN)
. Conditional survival curve in BL scenario
. qui gen SB_ = 1 - (1 - SB)/(1 - SPB)
. qui sum SB_
. Mean age started among those starting by age SxMax in BL scenario
. global XB = SxMin + r(mean)*SN
. di "Probability of not smoking (by age SxMax) = ",XB.3f SPB
Probability of not smoking (by age 50) = 0.243
. di "Mean age started (among those starting by age SxMax) = ",XB.1f SXB
Mean age started (among those starting by age 50) = 20.7
. drop SB_
. SBr3 = SB(x)*r3; SBr2 = SB(x)*r2; SBr1 = SB(x)*r1
. qui gen SBr1 = .
. qui gen SBr2 = .
. qui gen SBr3 = .
. gen SC = .
(42 missing values generated)
. prog def getSC
1. * S_1 = T1; S_2 = T2; S_3 = T3; S_4 = r1; S_5 = r2; S_6 = r3

```

```

39.   qui replace SC = SC + 'p' * SBr3
40.   )
41.   else if 'u1' <= 'u2' & 'u2' <= 'u3' & 'u3' <= 'u4'
42.   then
43.     qui replace SC = SC + 'p' * SBr2 in 1/'u3'
44.     if 'v3' <= SN (
45.       qui replace SC = SC + 'p' * SBr3 * 'A3' in 'v3'/SN
46.     )
47.   else if 'u2' > 0 & 'u1' <= 0 (
48.     * Case C: 'u1' <= 0 & 'u2' > 0 & 'u3' > 0
49.     * DEBUGGING
50.     * di "Case C"
51.     * qui replace SC = SC + 'p' * SBr1 in 1/'u2'
52.     * qui replace SC = SC + 'p' * SBr2 * 'A2' in 'v2'/'u3'
53.     * if 'v3' <= SN (
54.       qui replace SC = SC + 'p' * SBr3 * 'A3' * 'A3' in 'v3'/SN
55.     )
56.   else (
57.     * Case D: 'u1' > 0 & 'u2' > 0 & 'u3' > 0
58.     * DEBUGGING
59.     * di "Case D"
60.     * qui replace SC = SC + 'p' * SB in 1/'u1'
61.     * qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
62.     * if 'v2' <= 'u3' (
63.       qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
64.     )
65.     * if 'v3' <= SN (
66.       qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'
67.     )
68.     * /SN
69.     * local i = 'i' + 1
70.   )
71.   )
72.   * Lifetime probability of not smoking by age $dmax in CF scenario
73.   * global PC = SC(SN)
74.   * Conditional survival curve in CF scenario
75.   * tempvar SC_
76.   * qui gen SC_ = 1 - (1 - SC)/(1 - SPC)
77.   * qui sum SC_
78.   * Mean age started among those starting by age $dmax in CF scenario
79.   * global XC = $dmin + r(mean)*SN
80.   * di $7.0f $T1, $7.0f $T2, $7.0f $T3, $7.1f $r1, $7.1f $r2, $7.1f $r3, $7.3
81.   * f $PC, $PB, $7.2f $NB - $XC
82.   * 78. end
83.   *
84.   * prog def rangesC
85.   * 1. di = T1 T2 T3 r1 r2 r3 deltap deltax
86.   * 2. getSC 1954 1963 2001 1.0 1.0 1.0
87.   * 3. getSC 1954 1963 2001 1.0 0.9 1.0
88.   * 4. getSC 1954 1963 2001 1.0 0.8 1.0
89.   * 5. qui gen FC_lo = 1 - SC
90.   * 6. lab var FC_lo "FC (no post-2000 Misconduct) low est."

```



```

7. getSC 1954 1963 2001 1.0 0.8 0.8
8. qui gen FC7lo = 1 - SC
9. lab var FC7lo - FC (post-2000 Miscoconduct) low est.
10. getSC 1954 1963 2001 1.0 0.7 1.0
11. getSC 1954 1963 2001 1.0 0.6 1.0
12. getSC 1954 1963 2001 0.9 0.9 1.0
13. getSC 1954 1963 2001 0.9 0.8 1.0
14.

```

```

15. *****Wecker Change: replace 0.7 with 1.0*****

```

```

16. getSC 1954 1963 2001 0.9 0.7 1.0
17. getSC 1954 1963 2001 0.9 1.0 1.0
18.

```

```

19. *****End Wecker Change*****

```

```

20. qui gen FC_ = 1 - SC
21. lab var FC_ - FC (no post-2000 Miscoconduct) mid est.
22. getSC 1954 1963 2001 0.9 0.7 0.7
23.

```

```

24. qui gen FC7 = 1 - SC
25. lab var FC7 - FC (post-2000 Miscoconduct) mid est.
26.

```

```

27. getSC 1954 1963 2001 0.9 0.6 1.0
28. getSC 1954 1963 2001 0.8 0.8 1.0
29. getSC 1954 1963 2001 0.8 0.7 1.0
30. getSC 1954 1963 2001 0.8 0.6 1.0
31.

```

```

32. qui gen FC_hi = 1 - SC
33. lab var FC_hi - FC (no post-2000 Miscoconduct) high est.
34.

```

```

35. getSC 1954 1963 2001 0.8 0.6 0.6
36. qui gen FC7hi = 1 - SC
37. lab var FC7hi - FC (post-2000 Miscoconduct) high est.
38.

```

```

39. end

```

```

rangeSC

```

T1	T2	T3	r1	r2	r3	deltap	deltax
1954	1963	2001	1.0	1.0	1.0	0.000	0.00
1954	1963	2001	1.0	0.9	1.0	0.008	0.06
1954	1963	2001	1.0	0.8	1.0	0.017	0.13
1954	1963	2001	1.0	0.8	0.8	0.018	0.15
1954	1963	2001	1.0	0.7	1.0	0.027	0.21
1954	1963	2001	1.0	0.6	1.0	0.037	0.30
1954	1963	2001	0.9	0.9	1.0	0.016	0.03
1954	1963	2001	0.9	0.8	1.0	0.025	0.10
1954	1963	2001	0.9	1.0	1.0	0.008	-0.04
1954	1963	2001	0.9	0.7	0.7	0.036	0.21
1954	1963	2001	0.9	0.6	1.0	0.046	0.28
1954	1963	2001	0.8	0.8	1.0	0.034	0.07
1954	1963	2001	0.8	0.7	1.0	0.045	0.15
1954	1963	2001	0.8	0.6	1.0	0.056	0.25
1954	1963	2001	0.8	0.6	0.6	0.057	0.30

```

qui gen FB = 1 - SB

```

```

* Graph results for T1,T2 = 1954,1963 r1,r2 = 0.9,0.6 vs. T2 = 1988, r2 = 0.6
* gr FC_ FB x,ylab(0.25,.5,.75,1)xlabs(10,20,30,40,50)s(iiic(JJJJ))l("Cumula
> tive Proportion Who Have Begun to Smoke")saving(nir6a.replace)

```

```

* gr FC_ FC7 FB x,ylab(0.25,.5,.75,1)xlabs(10,20,30,40,50)s(iiic(JJJJ))l("Cumul
> ative Proportion Who Have Begun to Smoke")saving(nir6b.replace)

```

```

keep x F

```

```

form x %6.0f

```

52614 0803

```

form F* %7.3f

```

remove anir6.r2 - post-2000  
mitigation rate effects in  
HUMPHREY

x	FC_lo	FC7lo	FC_	FC7	FC_hi	FC7hi	FB
1.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.	0.022	0.022	0.022	0.022	0.022	0.022	0.022
3.	0.030	0.030	0.029	0.029	0.029	0.029	0.030
4.	0.041	0.041	0.041	0.041	0.040	0.040	0.041
5.	0.056	0.056	0.056	0.056	0.055	0.055	0.057
6.	0.082	0.082	0.082	0.081	0.080	0.080	0.083
7.	0.128	0.128	0.128	0.125	0.123	0.123	0.128
8.	0.195	0.195	0.194	0.191	0.187	0.187	0.196
9.	0.257	0.257	0.256	0.252	0.247	0.247	0.260
10.	0.343	0.343	0.342	0.336	0.328	0.328	0.347
11.	0.404	0.404	0.404	0.396	0.387	0.387	0.409
12.	0.478	0.478	0.478	0.468	0.457	0.457	0.485
13.	0.527	0.527	0.527	0.516	0.504	0.504	0.534
14.	0.557	0.557	0.558	0.545	0.532	0.532	0.565
15.	0.577	0.577	0.579	0.565	0.552	0.552	0.586
16.	0.596	0.596	0.598	0.584	0.570	0.570	0.605
17.	0.615	0.615	0.617	0.601	0.587	0.587	0.624
18.	0.630	0.630	0.632	0.616	0.601	0.601	0.640
19.	0.644	0.644	0.647	0.630	0.614	0.614	0.654
20.	0.653	0.653	0.656	0.638	0.622	0.622	0.664
21.	0.659	0.659	0.663	0.645	0.629	0.629	0.671
22.	0.672	0.672	0.676	0.657	0.640	0.640	0.684
23.	0.679	0.679	0.683	0.663	0.646	0.646	0.691
24.	0.686	0.686	0.690	0.670	0.653	0.653	0.698
25.	0.692	0.692	0.697	0.676	0.659	0.659	0.705
26.	0.700	0.700	0.705	0.684	0.665	0.665	0.713
27.	0.706	0.706	0.712	0.689	0.671	0.671	0.720
28.	0.710	0.710	0.716	0.693	0.674	0.674	0.724
29.	0.712	0.712	0.719	0.695	0.676	0.676	0.727
30.	0.716	0.716	0.722	0.699	0.679	0.679	0.730
31.	0.717	0.717	0.724	0.700	0.681	0.681	0.732
32.	0.725	0.725	0.732	0.707	0.687	0.687	0.740
33.	0.727	0.727	0.735	0.709	0.689	0.689	0.743
34.	0.728	0.728	0.736	0.710	0.690	0.690	0.744
35.	0.729	0.729	0.738	0.711	0.691	0.691	0.746
36.	0.731	0.731	0.739	0.712	0.692	0.692	0.747
37.	0.734	0.734	0.742	0.715	0.695	0.695	0.750
38.	0.735	0.735	0.744	0.717	0.696	0.696	0.752
39.	0.736	0.736	0.746	0.718	0.697	0.697	0.754
40.	0.736	0.736	0.746	0.718	0.697	0.697	0.754
41.	0.738	0.738	0.747	0.719	0.698	0.698	0.755
42.	0.739	0.739	0.749	0.721	0.701	0.701	0.757

```

* Compute changes in proportion who ever smoked

```

```

global N = _N

```

```

* Baseline scenario:

```

```

di %9.3f FB(SN)
0.757

```

```

proy def Results

```

```

1. di "----" Decrease in proportion smoked "----"
2. di "Post-2000 Low Middle High"
3. di "Miscoconduct Est. Est. Est."
4. di "Yes " %12.3f FB(SN) - FC7lo(SN), %12.3f FB(SN) - FC7hi(SN), %12.3f FB(SN)

```

air6.log

SN] - FC7hi(SN) - .w12.3f FB(SN) - FC\_lo(SN).w12.3f FB(SN) - FC\_hi(SN).w12.3f FB(SN)  
5. di - No  
6. end

Results  
----  
Decrease in proportion smoked  
Post-2000  
Misconduct  
Yes  
No

Low  
Est.  
0.018  
0.017

Middle  
Est.  
0.036  
0.008

High  
Est.  
0.057  
0.056

log close

# produced by RJRTC in HUMPHREY

52614 0804

91

```

drop _all
sumat pi
pi = pi + E[1,1]
pi = pi + E[1,2]
pi = pi + E[1,3]
pi = pi + E[1,4]
pi = pi + E[1,5]
pi = pi + E[1,6]
pi = pi + E[1,7]
pi = pi + E[1,8]
pi = pi + E[1,9]
pi = pi + E[1,10]
pi = pi + E[1,11]
pi = pi + E[1,12]
pi = pi + E[1,13]
pi = pi + E[1,14]
pi = pi + E[1,15]
pi = pi + E[1,16]
pi = pi + E[1,17]
pi = pi + E[1,18]
pi = pi + E[1,19]
pi = pi + E[1,20]
pi = pi + E[1,21]
pi = pi + E[1,22]
pi = pi + E[1,23]
pi = pi + E[1,24]
pi = pi + E[1,25]
pi = pi + E[1,26]
pi = pi + E[1,27]
pi = pi + E[1,28]
pi = pi + E[1,29]
pi = pi + E[1,30]
pi = pi + E[1,31]
pi = pi + E[1,32]
pi = pi + E[1,33]
pi = pi + E[1,34]
pi = pi + E[1,35]
pi = pi + E[1,36]
pi = pi + E[1,37]
pi = pi + E[1,38]
pi = pi + E[1,39]
pi = pi + E[1,40]
pi = pi + E[1,41]
pi = pi + E[1,42]
pi = pi + E[1,43]
pi = pi + E[1,44]
pi = pi + E[1,45]
pi = pi + E[1,46]
pi = pi + E[1,47]
pi = pi + E[1,48]
pi = pi + E[1,49]
pi = pi + E[1,50]
pi = pi + E[1,51]
pi = pi + E[1,52]
pi = pi + E[1,53]
pi = pi + E[1,54]
pi = pi + E[1,55]
pi = pi + E[1,56]
pi = pi + E[1,57]
pi = pi + E[1,58]
pi = pi + E[1,59]
pi = pi + E[1,60]
pi = pi + E[1,61]
pi = pi + E[1,62]
pi = pi + E[1,63]
pi = pi + E[1,64]
pi = pi + E[1,65]
pi = pi + E[1,66]
pi = pi + E[1,67]
pi = pi + E[1,68]
pi = pi + E[1,69]
pi = pi + E[1,70]
pi = pi + E[1,71]
pi = pi + E[1,72]
pi = pi + E[1,73]
pi = pi + E[1,74]
pi = pi + E[1,75]
pi = pi + E[1,76]
pi = pi + E[1,77]
pi = pi + E[1,78]
pi = pi + E[1,79]
pi = pi + E[1,80]
pi = pi + E[1,81]
pi = pi + E[1,82]
pi = pi + E[1,83]
pi = pi + E[1,84]
pi = pi + E[1,85]
pi = pi + E[1,86]
pi = pi + E[1,87]
pi = pi + E[1,88]
pi = pi + E[1,89]
pi = pi + E[1,90]
pi = pi + E[1,91]
pi = pi + E[1,92]
pi = pi + E[1,93]
pi = pi + E[1,94]
pi = pi + E[1,95]
pi = pi + E[1,96]
pi = pi + E[1,97]
pi = pi + E[1,98]
pi = pi + E[1,99]
pi = pi + E[1,100]

```

```

* (a) get distribution of birth year of all future claimants from age9.dta
use age9
keep year AllFutur
matrix pi = year.AllFutur
matrix drop year.AllFutur
* m = number of rows of pi
* col 1 (year t), col 2 (pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi
drop _all

* (b) Compute ever-smoking prevalence by birth cohort from nlr.dta
* Note: nlr.dta excludes insulator crossovers
drop _all
use nlr
keep coh Smok w
tab coh (w*), sum(Smok)

* Matrix E holds ever-smoking prevalence by cohort
matrix E = (1980, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971)
matrix E = E * J(5,1,0)
matrix colnames E = t0 t1 Ever

prog def setE
local i = 1
while 'i' <= 5 {
    qui sum Smok (w=w) if coh == 'i'
    matrix E[1,1,3] = r(mean)
    local i = 'i' + 1
}
end
setE
matrix li E

* (lc) Compute conditional distribn of birth year pi() among ever smokers

```

SRM500

```

nqr7: BL-CF differences in mean smoke-years exposure
based upon empirical smoke-survival curve and mortality
of claimants in HRA audit files (excluding insulator crossovers)
Relative risk quitting model hc(t) = r * h * t if year = 1980
hc(t) = R2 * hb(t) if T3 > year >= T2
hc(t) = R3 * hb(t) if year >= T3, where T3 > T2
(R3 can be any value, not just 1; T3 can be any value, not just 1999)
Projection to future claimants based upon birth-year distribution pi()
derived from age9.dta and distribution of ever-smokers by birth cohort
from nlr.dta

```

```

clear
prog drop _all
set matsize 400
set rmsg off
set more off

log using nqr7, replace

* Cutoff years for changes in quit rates are global variables T1, T2, T3
* Relative increase in quit rate (on or after year T1) is global variable SR1
* Relative increase in quit rate (on or after year T2) is global variable SR2
* Relative increase in quit rate (on or after year T3) is global variable SR3
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)

```

\* (la) get distribution of birth year of all future claimants from age9.dta

```

use age9
keep year AllFutur
matrix pi = year.AllFutur
matrix drop year.AllFutur
* m = number of rows of pi
* col 1 (year t), col 2 (pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi
drop _all

```

\* (lb) Compute ever-smoking prevalence by birth cohort from nlr.dta

\* Note: nlr.dta excludes insulator crossovers

```

drop _all
use nlr
keep coh Smok w
tab coh (w*), sum(Smok)

```

\* Matrix E holds ever-smoking prevalence by cohort

```

matrix E = (1980, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971)
matrix E = E * J(5,1,0)
matrix colnames E = t0 t1 Ever

```

```

prog def setE
local i = 1
while 'i' <= 5 {
    qui sum Smok (w=w) if coh == 'i'
    matrix E[1,1,3] = r(mean)
    local i = 'i' + 1
}
end
setE
matrix li E

```

\* (lc) Compute conditional distribn of birth year pi() among ever smokers

nqr7\_R2.do

```

qui replace LSR1 = L*SB*SR1
qui replace LSR2 = L*SB*SR2
qui replace LSR3 = L*SB*SR3

```

```

qui replace SC = 0

```

```

Compute SC = SUM((L(x)-SB(x))*R1*SR1)

```

```

SB(min(x,T2-t))*(R1-R2)*SB(min(x,T3-t))

```

```

Sum over index 'i' (rows of pi)

```

```

local i = 1

```

```

while 'j' <= 5m {

```

```

    local t = pi('i',1)

```

```

    't' year of birth

```

```

    local u1 = ST1 - 't' - 5xMin - 1

```

```

    local v1 = 'u1' + 1

```

```

    local u2 = ST2 - 't' - 5xMin - 1

```

```

    local v2 = 'u2' + 1

```

```

    local u3 = min(ST3 - 't' - 5xMin - 1,SN)

```

```

    local v3 = 'u3' + 1

```

```

    Compute intermediate 'areas'

```

```

    local A1 = SB('u1',1-SR1)

```

```

    local A2 = SB('u2',1-(SR1-SR2))

```

```

    local A3 = SB('u3',1-(SR2-SR3))

```

```

    'u3' > 'u2' > 'u1' required

```

```

Case A:

```

```

    if 'u3' <= 0 {

```

```

        qui replace SC = SC + pi('i',2) * LSR3

```

```

    }

```

```

    else {

```

```

        Case B:

```

```

            if 'u3' > 0 & 'u2' <= 0 {

```

```

                qui replace SC = SC + pi('i',2) * LSR2 in 1/'u3'

```

```

            }

```

```

            if 'v3' <= SN {

```

```

                qui replace SC = SC + pi('i',2) * LSR3 * 'A3' in 'v3'/SN

```

```

            }

```

```

            else {

```

```

                Case C:

```

```

                    if 'u2' > 0 & 'u1' <= 0 {

```

```

                        qui replace SC = SC + pi('i',2) * LSR1 in 1/'u2'

```

```

                    }

```

```

                    if 'v3' <= SN {

```

```

                        qui replace SC = SC + pi('i',2) * LSR3 * 'A2' * 'A3' in 'v3'/SN

```

```

                    }

```

```

                    else {

```

```

                        Case D:

```

```

                            qui replace SC = SC + pi('i',2) * LSR1 in 1/'u1'

```

```

                        }

```

```

                            qui replace SC = SC + pi('i',2) * LSR2 * 'A1' in 'v1'/'u2'

```

```

                        }

```

```

                            qui replace SC = SC + pi('i',2) * LSR3 * 'A1' * 'A2' in 'v2'/'u3'

```

```

                        }

```

```

                            if 'v3' <= SN {

```

```

                                qui replace SC = SC + pi('i',2) * LSR3 * 'A1' * 'A2' * 'A3' in 'v3'/SN

```

```

                            }

```

```

                        }

```

```

                    }

```

```

                local i = 'i' + 1

```

```

            }

```

```

        qui sum SC

```

```

        global EC = r(mean)*SN

```

```

        di %7.0f $T1.%7.0f $T2.%7.0f $T3.%7.0f $R1.%8.1f $R2.%8.1f $R3.%8.2f $EB.%8.2f SEC.%8.

```

```

        2f $EB - SEC

```

```

    end

```

```

prog def rangeSC

```

```

    di - T1 T2 T3 R1 R2 R3 XB XC deltax

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

qui gen SC_lo = SC

```

```

lab var SC_lo "Scatter plot post-2000"

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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LSC 1954 1963 2001 1.0 2.1 1.0

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```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

```

LSC 1954 1963 2001 1.0 2.1 1.0

```

dx7.log

```
* Cutoff years for changes in quit rates are global variables ST1, ST2, ST3
* Relative increase in quit rate (on c...
* Relative increase in quit rate (on c...
* Relative increase in quit rate (on c...
* (R3) can be any value, not just 1; T can be any value, not just 1999)
```

```
* (1a) get distribution of birth year of all future claimants from age9.dta
* use age9
```

```
* keep year AllFutur
```

```
* mkmst year AllFutur
```

```
* matrix pi = year.AllFutur
```

```
* matrix drop year AllFutur
```

```
* m = number of rows of pi
```

```
* col 1 (year t), col 2 (pi(t))
```

```
* matrix colnames pi = t pi(t)
```

```
* global m = rowsof(pi)
```

```
* matrix list pi
```

```
pi[72,2]
```

```

t      pi(t)
1900 .00004113
1901 .000022101
1902 .000031102
1903 .00004538
1904 .00006578
1905 .00009443
1906 .00013421
1907 .0001888
1908 .00026279
1909 .00036178
1910 .00049251
1911 .00066282
1912 .00088162
1913 .00115874
1914 .00150459
1915 .00192976
1916 .0024442
1917 .00305756
1918 .00377616
1919 .00460425
1920 .00554198
1921 .00658479
1922 .00772278
1923 .00894043
1924 .01021674
1925 .01152602
1926 .01283937
1927 .01412696
1928 .0153611
1929 .01652004
1930 .0175923
1931 .01858097
1932 .01950742
1933 .020401352
1934 .02020139
1935 .0220242851
```

```

r37 1936 .02370143
r38 1937 .02526133
r39 1938 .02745919
r40 1939 .0299204
r41 1940 .0325337
r42 1941 .035346
r43 1942 .03790521
r44 1943 .04074331
r45 1944 .04321814
r46 1945 .04507414
r47 1946 .04608816
r48 1947 .04609812
r49 1948 .0450277
r50 1949 .04289862
r51 1950 .03982827
r52 1951 .03601309
r53 1952 .03170349
r54 1953 .02616135
r55 1954 .0226426
r56 1955 .0193813
r57 1956 .01652232
r58 1957 .0117046
r59 1958 .00837034
r60 1959 .00611337
r61 1960 .00435552
r62 1961 .00303046
r63 1962 .00206233
r64 1963 .00137566
r65 1964 .00096207
r66 1965 .00058381
r67 1966 .00037486
r68 1967 .0002404
r69 1968 .00015518
r70 1969 .00010166
r71 1970 .0000681
r72 1971 .00017831
```

```
* drop _all
```

```

* (1b) Compute ever-smoking prevalence by birth cohort from nlr.dta
* Note: 'nir.dta' excludes Insulator crossovers
* drop _all
```

```
* use 'nir'
```

```
* keep coh Smok w
```

```

* tab coh (wsw), sum(Smok)
(analytic weights assumed)
```

cohort	Mean	Std. Dev.	Freq.	Obs.
-1909	.65828276	.47546956	84663	201
1910-19	.78556302	.41063019	5166357	1032
1920-29	.79826907	.40141712	11307582	1609
1930-39	.75219631	.43200298	7859782	813
1940-	.7517905	.43243825	5989541	466
Total	.77161249	.41971504	31169725	4121

```
* Matrix E holds ever-smoking prevalence by cohort
```

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nqr7.log

```
matrix E = (1890, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971 )
```

```
matrix E = E, J(5,1,0)
```

```
matrix colnames E = t0 t1 Ever
```

```
prog def setE
```

```
1. local i = 1
2. while 'i' <= 5 {
3.   qui sum Smok (w=w) if coh == 'i'
4.   matrix E["i",3] = r(mean)
5.   local i = 'i' + 1
6. }
7. end
```

```
setE
```

```
matrix li E
```

```
E[5,3]
t0      t1      Ever
11      1890    65828276
12      1910    78556302
13      1920    79826907
14      1930    75219631
15      1940    7517905
```

```
/* (1c) Compute conditional distribn of birth year pi() among ever smokers
```

```
drop _all
```

```
svmat pi
```

```
number of observations will be reset to 72
Press any key to continue, or Break to abort
obs was 0, now 72
```

```
ren pi1 t
```

```
ren pi2 pi
```

```
qui gen pi_ =
```

```
form pi_ = 49.4f
```

```
prog def getpi
```

```
1. local i = 1
2. while 'i' <= 5 {
3.   replace pi_ = pi * E["i",3] if t >= E["i",1] & t <= E["i",2]
4.   Note: In CF with pre-1988 misconduct, ever-smoking prevalence
       of 1940+ birth cohort will be reduced by 3.6%. (mir4.log).
       But this feedback effect is very small.
5.   local i = 'i' + 1
6. }
7. qui sum pi_
8. global sumpi = r(mean)*r(N)
9. qui replace pi_ = pi_ / sumpi
10. end
```

```
getpi
```

```
(10 real changes made)
(10 real changes made)
(10 real changes made)
```

```
(10 real changes made)
(32 real changes made)
```

```
matrix pi_ = pi, col of matrix pi()
```

```
matrix pi_ = pi(1..5m,1..1)
```

```
matrix pi = pi, pi_
```

```
/* (2c) Compute Mean Years Smoked Among Persons Who Ever Smoked
```

```
drop _all
```

# HUMPHREY

```
global xmin = r(min)
```

```
global N = _N
```

```
/* LSB is proportion who are still smoking and alive
```

```
gen LSB = L*SB
```

```
qui sum LSB
```

```
/* EB is mean smoke-years taking mortality into account
```

```
global EB = r(mean)*SN
```

```
di "Mean smoke-years (BL) = ", 49.2f $EB
```

```
Mean smoke-years (BL) = 45.43
```

```
/* LSBR3 = L(x)*SB(x)^R3; LSBR2 = L(x)*SB(x)^R2; LSBR1 = L(x)*SB(x)^R1
```

```
gen LSBR1 =
```

```
(82 missing values generated)
```

```
gen LSBR2 =
```

```
(82 missing values generated)
```

```
gen LSBR3 =
```

```
(82 missing values generated)
```

```
gen SC =
```

```
(82 missing values generated)
```

```
prog def LSC
```

```
1. * $_1 = T1; $_2 = T2; $_3 = T3; $_4 = R1; $_5 = R2; $_6 = R3
   global T1 = $_1
2. global T2 = $_2
3. global T3 = $_3
4. global R1 = $_4
5. global R2 = $_5
6. global R3 = $_6
7. * Check T3 > T2 > T1
   if $T2 <= $T1 | $T3 <= $T2 {
8.   di "Invalid ", 49.0f $T1, $T2, $T3
9.   exit
10.  }
```

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50. end

X3 X2 XC

與

3X

rangeSC	T1	T2	T3	R1	R2	R3	XB	XC	deltax
	1954	1963	2001	1.0	2.1	1.0	45.43	37.06	8.37
	1954	1963	2001	1.0	2.1	2.1	45.43	34.47	10.96
	1954	1963	2001	1.0	2.4	1.0	45.43	35.34	10.09
	1954	1963	2001	1.0	3.6	1.0	45.43	32.42	13.01
	1954	1963	2001	1.0	3.6	1.0	45.43	30.03	15.40
	1954	1963	2001	1.5	2.4	1.0	45.43	35.12	10.31
	1954	1963	2001	1.5	2.0	1.0	45.43	45.11	0.32
	1954	1963	2001	1.5	3.0	3.0	45.43	29.53	15.90
	1954	1963	2001	1.5	3.6	1.0	45.43	29.85	15.58
	1954	1963	2001	2.0	2.4	1.0	45.43	34.90	10.52
	1954	1963	2001	2.0	3.0	1.0	45.43	32.03	13.40
	1954	1963	2001	2.0	3.6	1.0	45.43	29.68	15.75
	1954	1963	2001	2.0	3.9	1.0	45.43	28.65	16.77
	1954	1963	2001	2.5	3.0	3.9	45.43	26.30	19.13
	1954	1963	1999	1.5	3.0	1.0	45.43	32.75	13.68

```
qui sum SC
global EC = r(mean)*$N
di %7.0f $T1, %7.0f $T2,
```

nqr7.log

```

1956 1963 2000 1.5 3.0 1.0 45.43 32.48 12.95
yi SC_ LSB x if x=75,ylab(0.25,.5,
  "Proportion Still Alive and Smoking"
  ,save=nqr7b,replace)
yi SC_ SC} LSB x if x=75,ylab(0.25,
  "Proportion Still Alive and Smoking"
  ,save=nqr7b,replace)

```

form LSB SC\* \*7.3f

form x \*6.0f

keep x LSB SC\_\*

1. nod

x	LSB	SC_lo	SC_	SC_hi
1	1.000	1.000	1.000	1.000
2	1.000	1.000	1.000	1.000
3	1.000	1.000	1.000	1.000
4	1.000	1.000	1.000	1.000
5	1.000	1.000	1.000	1.000
6	1.000	1.000	1.000	1.000
7	1.000	1.000	1.000	1.000
8	1.000	1.000	1.000	1.000
9	1.000	1.000	1.000	1.000
10	1.000	1.000	1.000	1.000
11	1.000	1.000	1.000	1.000
12	1.000	1.000	1.000	1.000
13	1.000	1.000	1.000	1.000
14	1.000	1.000	1.000	1.000
15	1.000	1.000	1.000	1.000
16	1.000	1.000	1.000	1.000
17	1.000	1.000	1.000	1.000
18	1.000	1.000	1.000	1.000
19	1.000	1.000	1.000	1.000
20	1.000	1.000	1.000	1.000
21	1.000	1.000	1.000	1.000
22	1.000	1.000	1.000	1.000
23	1.000	1.000	1.000	1.000
24	1.000	1.000	1.000	1.000
25	1.000	1.000	1.000	1.000
26	1.000	1.000	1.000	1.000
27	1.000	1.000	1.000	1.000
28	1.000	1.000	1.000	1.000
29	1.000	1.000	1.000	1.000
30	1.000	1.000	1.000	1.000
31	1.000	1.000	1.000	1.000
32	1.000	1.000	1.000	1.000
33	1.000	1.000	1.000	1.000
34	1.000	1.000	1.000	1.000
35	1.000	1.000	1.000	1.000
36	1.000	1.000	1.000	1.000
37	1.000	1.000	1.000	1.000
38	1.000	1.000	1.000	1.000
39	1.000	1.000	1.000	1.000
40	1.000	1.000	1.000	1.000
41	1.000	1.000	1.000	1.000
42	1.000	1.000	1.000	1.000
43	1.000	1.000	1.000	1.000
44	1.000	1.000	1.000	1.000
45	1.000	1.000	1.000	1.000
46	1.000	1.000	1.000	1.000
47	1.000	1.000	1.000	1.000
48	1.000	1.000	1.000	1.000
49	1.000	1.000	1.000	1.000
50	1.000	1.000	1.000	1.000
51	1.000	1.000	1.000	1.000
52	1.000	1.000	1.000	1.000
53	1.000	1.000	1.000	1.000
54	1.000	1.000	1.000	1.000
55	1.000	1.000	1.000	1.000
56	1.000	1.000	1.000	1.000
57	1.000	1.000	1.000	1.000
58	1.000	1.000	1.000	1.000
59	1.000	1.000	1.000	1.000
60	1.000	1.000	1.000	1.000
61	1.000	1.000	1.000	1.000
62	1.000	1.000	1.000	1.000

. save nqr7\_R2, replace  
file nqr7\_R2.dta saved

. log close

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08R500

nqr8: BL-CF differences in mean smoke-years exposure

Based upon empirical smoke-survival curve and mortality

of claimants in HRA audit files

Relative risk quitting model  $hC(t) = \exp(\beta_0 + \beta_1 \text{year} + \beta_2 \text{quit})$  $hC(t) = R2 \cdot hB(t)$  if  $T3 > \text{year} \geq T2$ , where  $T2 = T3 - T1$  $hC(t) = R3 \cdot hB(t)$  if  $\text{year} \geq T3$ , where  $T3 > T2$ 

(R3) can be any value, not just 1; T3 can be any value, not just 1999)

Scenario	pre-R4 misconduct	Estimate	R1	R2	R3
BL			1.0	1.0	1.0
CF	low		1.0	2.1	1.0
CF	mid		1.5	3.0	1.0
CF	high		2.0	3.9	1.0

Input files: nqr, nqr4

clear

prog drop \_all

set matsize 800

set rmsg off

set more off

using nqr4, replace

- Cutoff: Years for changes in quit rates are global variables ST1, ST2, ST3
- Relative increase in quit rate (on or after year T1) is global variable SR1
- Relative increase in quit rate (on or after year T2) is global variable SR2
- Relative increase in quit rate (on or after year T3) is global variable SR3
- (R3) can be any value, not just 1; T3 can be any value, not just 1999)

- (1) Conditional distribn of birth year  $pi()$  among 'past' ever smokers

```

use nqr
* Save distribution of yrborn in Matrix pi(t)
qui tab yrborn [wsk], matcell(pi) mrow(t_)
matrix pi = pi/_result(1)
matrix pi = t_ pi
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix drop t_
matrix list pi

```

- (2) Compute Mean Years Smoked Among Persons Who Ever Smoked

```

drop _all
* Get L and SB from nqr4 output
use nqr4
qui sum x
global xMin = r(min)
global N = _N

```

- LSB is proportion who are still smoking and alive

gen LSB = L\*SB

gen sum LSB

- EB is mean smoke-years taking mortality into account

global EB = r(mean)\*SN

di Mean smoke-years (BL)

\* LSBR3 = L(X)\*SB(X)\*R3; LSBR2 = L(X)\*SB(X)\*R2; LSBR1 = L(X)\*SB(X)\*R1

gen LSBR1 =

gen LSBR2 =

gen LSBR3 =

gen SC =

prog def LSC

\*  $S_{-1} = T1$ ;  $S_{-2} = T2$ ;  $S_{-3} = T3$ ;  $S_{-4} = R1$ ;  $S_{-5} = R2$ ;  $S_{-6} = R3$ global T1 =  $S_{-1}$ global T2 =  $S_{-2}$ global T3 =  $S_{-3}$ global R1 =  $S_{-4}$ global R2 =  $S_{-5}$ global R3 =  $S_{-6}$ Check  $T3 > T2 > T1$ if  $ST2 \leq ST1$  |  $ST3 \leq ST2$  {

di .Invalid .49 of ST1,ST2,ST3

quit

\* Compute SB(X)\*R1 and L(X)\*SB(X)\*R1

\* Compute SB(X)\*R2 and L(X)\*SB(X)\*R2

\* Compute SB(X)\*R3 and L(X)\*SB(X)\*R3

qui replace LSBR1 = L\*SB\*R1

qui replace SB1 = SB\*R2

qui replace SB2 = SB\*R3

qui replace SC = 0

\* Compute C =  $\sum_{t=T1}^{T2} L(X) \cdot SB(X) \cdot R3 \cdot SB(\min(X, T1-t))^{(1-R1)}$ \*  $SB(\min(X, T2-t))^{(R1-R2)} \cdot SB(\min(X, T3-t))^{(R2-R3)}$  for all x

\* Sum over index 'i' (rows of pi)

local i = 1

while 'i' &lt;= Sm {

local t = pi('i',1)

\* 't' year of birth

local u1 =  $ST1 - 't' - \$xMin - 1$ 

local v1 = 'u1' + 1

local u2 =  $ST2 - 't' - \$xMin - 1$ 

local v2 = 'u2' + 1

local u3 =  $\min(ST3 - 't' - \$xMin - 1, SN)$ 

local v3 = 'u3' + 1

\* Compute intermediate 'areas'

local A1 =  $SB('u1')^{(1-SR1)}$ local A2 =  $SB('u2')^{(SR1-SR2)}$ local A3 =  $SB('u3')^{(SR2-SR3)}$ 

\* 'u3' &gt; 'u2' &gt; 'u1' required

\* Case A:

if 'u3' &lt;= 0 {

qui replace SC =  $SC + pi('i',2) \cdot LSBR3$ 

}

\* Case B:

if 'u3' &gt; 0 &amp; 'u2' &lt;= 0 {

qui replace SC =  $SC + pi('i',2) \cdot LSBR2$  in 1/'u3'

if 'v3' &lt;= SN {

qui replace SC =  $SC + pi('i',2) \cdot LSBR3 \cdot 'A3'$  in 'v3'/SN

}

\* Case C:

if 'u2' &gt; 0 &amp; 'u1' &lt;= 0 {

qui replace SC =  $SC + pi('i',2) \cdot LSBR1$  in 1/'u2'qui replace SC =  $SC + pi('i',2) \cdot LSBR2 \cdot 'A2'$  in 'v2'/'u3'

if 'v3' &lt;= SN {

qui replace SC =  $SC + pi('i',2) \cdot LSBR3 \cdot 'A2' \cdot 'A3'$  in 'v3'/'v3'/SN

}

\* Case D:

if 'u3' &gt; 0 &amp; 'u2' &gt; 0 &amp; 'u1' &lt;= 0 {

qui replace SC =  $SC + pi('i',2) \cdot LSBR1$  in 1/'u2'qui replace SC =  $SC + pi('i',2) \cdot LSBR2 \cdot 'A1'$  in 'v1'/'u2'qui replace SC =  $SC + pi('i',2) \cdot LSBR3 \cdot 'A1' \cdot 'A2'$  in 'v2'/'u3'

if 'v3' &lt;= SN {

}

}

}

}

}

}

}

}

}

}

}

}

}

}

}

nqr8\_R2.do

1. nod  
save nqr8\_R2, replace

produced by RJRTC

in

HUMPHREY

qui replace SC = SC \* pi('1',2) \* LSR3 \* 'A1' \* 'A2' \* 'A3' in 'v3'/\$N  
di 17.0f 571.17.0f 572.17.0f 573.18.1f SR1.18.1f SR2.18.1f SR3.18.2f SEB.18.2f SEC.18.2f  
2f SEB - SEC  
end

proc def rangeSC  
di - T1 T2 T3 R1 R2 R3 XB XC deltaX

LSC 1954 1963 2001 1.0 2.1 1.0  
qui gen SC\_lo = SC  
lab var SC\_lo "SC (R=1 post-2000) low est."  
LSC 1954 1963 2001 1.0 2.1 2.1  
LSC 1954 1963 2001 1.0 2.4 1.0  
LSC 1954 1963 2001 1.0 3.0 1.0  
LSC 1954 1963 2001 1.0 3.6 1.0  
LSC 1954 1963 2001 1.5 2.4 1.0

\*\*\*\*\*Wecker Change: change 3.0 to 1.0\*\*\*\*\*  
"LSC 1954 1963 2001 1.5 3.0 1.0  
LSC 1954 1963 2001 1.5 1.0 1.0  
\*\*\*\*\*End Wecker Change\*\*\*\*\*

qui gen SC\_hi = SC  
lab var SC\_hi "SC (R=1 post-2000) middle est."  
LSC 1954 1963 2001 1.5 3.0 3.0  
qui gen SC3 = SC  
lab var SC3 "SC (R=3 post-2000) middle est."  
LSC 1954 1963 2001 1.5 3.6 1.0  
LSC 1954 1963 2001 2.0 2.4 1.0  
LSC 1954 1963 2001 2.0 3.0 1.0  
LSC 1954 1963 2001 2.0 3.6 1.0  
LSC 1954 1963 2001 2.0 3.9 1.0  
qui gen SC\_h1 = SC  
lab var SC\_h1 "SC (R=1 post-2000) high est."  
LSC 1954 1963 2001 2.0 3.9 3.9  
LSC 1954 1963 1999 1.5 3.0 1.0  
LSC 1954 1963 2000 1.5 3.0 1.0

end

rangeSC

qr SC\_LSB x if x<75.ylab(0..25,.5,.75,1)xlab(20,30,40,50,60,70)s(i)c(JJ)11("Proportio  
n Still Alive and Smoking")saving(nqr8e,replace)  
qr SC\_SC3 LSB x if x<75.ylab(0..25,.5,.75,1)xlab(20,30,40,50,60,70)s(i)c(JJ)11("Pro  
portion Still Alive and Smoking")saving(nqr8e,replace)

```

* gen SC = .
(*2 missing values generated)

* Cutoff years for changes in quit rates are global variables ST1, ST2, ST3
* Relative increase in quit rate (on or after year t1) is global variable SR1
* Relative increase in quit rate (on or after year t2) is global variable SR2
* Relative increase in quit rate (on or after year t3) is global variable SR3
* (R3 can be any value, not just 1; t3 can be any value, not just 1995)

* (1) Conditional distribn of birth year pi() among "past" ever smokers
use nqr
* Save distribution of yrborn in Matrix pi(t)
qui tab yrborn [w=1, matcell(pi) matrow(t_)

Matrix pi = pi/_result(1)
Matrix pi = t_, pi

* m = number of rows of pi
* col i (year t), col 2(pi(t))
Matrix colnames pi = t pi(t)

Global m = rowsof(pi)
Matrix drop t_

* Matrix list pi

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked
B:/*_all
* Get L and SB from nqr4 output
use nqr4
qui sum x

Global xMin = r(min)
Global N = _N

* L&B is proportion who are still smoking and alive
gen L&B = L*SB

qui sum L&B

EB is mean smoke-years taking mortality into account
Global EB = (BL) * (mean)*SN
Mean smoke-years = (BL) * (mean)*SN
45.43

L&B3 = L(x)*SB(x)*R3; L&B2 = L(x)*SB(x)*R2; L&B1 = L(x)*SB(x)*R1
* gen L&B1 = L&B3
(*2 missing values generated)
* gen L&B2 = .
(*2 missing values generated)
* gen L&B3 = .
(*2 missing values generated)

* gen SC = .
(*2 missing values generated)

1. * Compute SC = SUM(t) pi(t) * L(x) * SB(x) * R3 * SB(min(x, T1-t))^(1-R1) *
* SB(min(x, T2-t))^(1-R2) * SB(min(x, T3-t))^(1-R3) for all x
* Sum over index 'i' (rows of pi)
* local i = 1
16. while 'i' <= $m (
17. local t = pi['i',1]
18. * 't' year of birth
* local u1 = ST1 - 't' - $xMin - 1
19. local v1 = 'u1' + 1
20. local u2 = ST2 - 't' - $xMin - 1
21. local v2 = 'u2' + 1
22. local u3 = min(ST3 - 't' - $xMin - 1, SN)
23. local v3 = 'u3' + 1
24. * Compute intermediate 'areas'
* local A1 = SB['u1']^(1-SR1)
25. local A2 = SB['u2']^(1-SR2)
26. local A3 = SB['u3']^(1-SR3)
27. * 'u3' > 'u2' > 'u1' required
* Case A:
* if 'u3' <= 0 (
28. * qui replace SC = SC + pi['i',2] * L&B3
29. )
30. else (
31. * Case B:
* if 'u3' > 0 & 'u2' <= 0 (
32. * qui replace SC = SC + pi['i',2] * L&B2 in 1/'u3'
33. * if 'v3' <= SN (
34. * qui replace SC = SC + pi['i',2] * L&B3 * A3 in 'v3'/SN
35. )
36. )
37. else (
38. * Case C:
* if 'u2' > 0 & 'u1' <= 0 (
39. * qui replace SC = SC + pi['i',2] * L&B1 in 1/'u2'
40. * qui replace SC = SC + pi['i',2] * L&B2 * A2 in 'v2'/'u3'
41. * if 'v3' <= SN (
42. * qui replace SC = SC + pi['i',2] * L&B3 * A2 * A3 in 'v3'/
43. )
44. )
45. else (

```

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nqr8.log

30.	46	0.776	0.657	0.755	0.480
31.	47	0.760	0.631	0.739	0.445
32.	48	0.742	0.601	0.721	0.407
33.	49	0.710	0.582	0.709	0.385
34.	50	0.706	0.545	0.685	0.444
35.	51	0.695	0.529	0.675	0.422
36.	52	0.678	0.505	0.659	0.415
37.	53	0.659	0.478	0.640	0.270
38.	54	0.642	0.453	0.623	0.245
39.	55	0.618	0.422	0.600	0.216
40.	56	0.596	0.394	0.578	0.192
41.	57	0.573	0.366	0.556	0.168
42.	58	0.559	0.349	0.542	0.155
43.	59	0.536	0.324	0.520	0.137
44.	60	0.510	0.297	0.495	0.118
45.	61	0.492	0.279	0.478	0.107
46.	62	0.473	0.261	0.459	0.096
47.	63	0.438	0.238	0.434	0.083
48.	64	0.428	0.221	0.416	0.074
49.	65	0.411	0.207	0.399	0.067
50.	66	0.390	0.191	0.378	0.060
51.	67	0.374	0.179	0.363	0.055
52.	68	0.355	0.166	0.345	0.049
53.	69	0.335	0.152	0.325	0.044
54.	70	0.316	0.141	0.307	0.040
55.	71	0.299	0.130	0.290	0.036
56.	72	0.285	0.122	0.276	0.034
57.	73	0.273	0.116	0.265	0.032
58.	74	0.260	0.109	0.252	0.030
59.	75	0.250	0.104	0.242	0.028
60.	76	0.236	0.097	0.229	0.026
61.	77	0.222	0.091	0.216	0.024
62.	78	0.213	0.087	0.207	0.023
63.	79	0.203	0.083	0.197	0.022
64.	80	0.191	0.078	0.186	0.021
65.	81	0.176	0.071	0.171	0.019
66.	82	0.167	0.068	0.162	0.018
67.	83	0.161	0.065	0.157	0.017
68.	84	0.159	0.065	0.155	0.017
69.	85	0.158	0.064	0.153	0.017
70.	86	0.157	0.063	0.152	0.017
71.	87	0.149	0.060	0.145	0.016
72.	88	0.141	0.057	0.137	0.015
73.	89	0.127	0.051	0.123	0.014
74.	90	0.126	0.051	0.123	0.014
75.	91	0.126	0.051	0.123	0.014
76.	92	0.126	0.051	0.123	0.014
77.	93	0.126	0.051	0.123	0.014
78.	94	0.117	0.047	0.113	0.013
79.	95	0.117	0.047	0.113	0.013
80.	96	0.117	0.047	0.113	0.013
81.	97	0.117	0.047	0.113	0.013
82.	98	0.117	0.047	0.113	0.013

save nqr8.R2, replace

# Produced by RJRTC in HUMPHREY



```
* Future Claimsants: Effects of decreased initiation
```

```
use(mit6_1)
```

```
* Compute frequency distributions
```

```
prog def Freq
```

```
1. qui gen f5_1 = f5_1 - f5_1[_n-1]
```

```
2. end
```

```
Freq B
```

```
Freq C_lo
```

```
Freq C_
```

```
Freq C_hi
```

```
drop F*
```

```
drop in 1
```

```
(* observation deleted)
```

```
form f = %7.3f
```

```
form x = %6.0f
```

```
* Combine with results on Past Claimsants: Effect of Increase Quit Rates
```

```
merge x using (ndxr_R2
```

```
ren LSB SB
```

```
* Reverse sort order to compute conditional means
```

```
gen byte n = "_N" - "_n"
```

```
sort n
```

```
drop n
```

```
* Compute conditional means
```

```
prog def CondMean
```

```
1. qui replace SS_1[_n-1] if (_n-1) if f5_1[_n-1] if f5_1[_n-1]
```

```
2. qui gen m5_1 = sum(SS_1)
```

```
3. qui replace m5_1 = m5_1/SS_1
```

```
4. end
```

```
CondMean B
```

```
CondMean C_lo
```

```
CondMean C_
```

```
CondMean C_hi
```

```
* keep x f m
```

```
form m = %7.3f
```

```
x
```

```
sort
```

```
(* observations deleted)
```

```
== %7.3f drop
```

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produced by **PARTRC**

in

**HUMPHREY**

```
* Compute Mean Years Smoked (MYS)
prog def mX
1. qui gen SS_1 = 0
2. qui gen SS_2 = 0
3. qui gen SS_3 = 0
4. drop SS_1
5. end
```

```
* mX C_
```

```
* mX C_
```

```
* mX C_
```

```
* mX C_
```

```
* mX C_
```

```
* prog def Results
```

```
1. di "----" Decrease in mean years smoked "----"
```

```
2. di "Post-2000" Low Middle High
```

```
3. di "Misconduct" Est. Est. Est.
```

```
4. di "No" *%12.1f $XB - $XC_lo %12.1f $XB - $XC_ %12.1f $XB - $XC_hi
```

```
5. end
```

```
* Results
```

```
--- Decrease in mean years smoked ---
```

```
Post-2000 Low Middle High
```

```
Misconduct Est. Est. Est.
```

```
No 6.9 0.9 13.3
```

```
* Convert results to matrix & save
```

```
* matrix def dX = J(2,3,0)
```

```
* matrix def dX = J(1,3,0)
```

```
* matrix dX[1,1] = $XB - $XC_lo
```

```
* matrix dX[1,2] = $XB - $XC_
```

```
* matrix dX[1,3] = $XB - $XC_hi
```

```
* drop _all
```

```
* svmat dX
```

```
number of observations will be reset to 1
```

```
Press any key to continue, or Break to abort
```

```
obs was 0, now 1
```

```
* gen byte Scenario = _n
```

```
* lab def Scenario 1="No-Post2000" 2="Post2000"
```

```
* lab val Scenario Scenario
```

```
* ren dX1 dX_lo
```

```
* ren dX2 dX
```

ndx4.log

```
ren dx3 dx_hi
gen byte Era = 1
lab def Era 1 "Past" 2 "Future"
lab val Era Era
order Era Scenario dx_lo dx dx_hi
form dx= %9.2f
save ndx4_R2_P2. replace
file ndx4_R2_P2.dta saved
1
1. Era Scenario dx_lo
Past No Post2000 6.86
log close
```

produced by R.JRTC  
in

HUMPHREY

dx\_lo  
6.86

dx  
0.90

dx\_hi  
13.2

c.f. Harris's reduction in mean smokys g 10.65



```

** LIMDEP 7.0 source code:
Multivariate normal analysis of:
1. cumulative incidence of Lung Cancer (diedLC);
2. prevalence of parenchymal disease by Hx, profusion;
3. abnormal pulmonary function by age, sex, and
determination of FVC (PFT); and
4. Pleural injury (anyPleu)
This 'main' version assumes that there is no relationship between
smoking and pleural injury.
Exposure results based upon assumption of no misconduct post-2000.

```

```

/* Restrict analysis to main sample (2,243) rather than
extended sample (2,609) */
reject; new; w = 0 $
skip

```

```

/* RHS variables (including years smoked, age categories,
categories of post-latency asbestos exposure as 'X' */
namelist: X = one, smokyrs, ageG*, T10_* $

```

```

* Separate namelist with years smoked dropped for pleural disease
dose-response models only */
namelist: Xo = one, ageG*, T10_* $

```

```

** Descriptive statistics (sample means) of RHS variables */
dstat; rhs = X $

```

```

** Save sample mean values of X's (and constant) in X_BL,
which corresponds to baseline scenario (BL) */
matrix: Xmeans = part(LastData, 1, 7, 1, 1) $
* Append 1 to vector of sample means */
matrix: u = {1} $
matrix: X_BL = {u / Xmeans} $

```

```

* Construct conformal vector for Xo_BL */
dstat; rhs = Xo $
matrix: Xmeans = part(LastData, 1, 6, 1, 1) $
matrix: Xo_BL = {u / Xmeans} $

```

```

** Univariate models: Show marginal effects.
Note: LIMDEP computes partial derivatives dF/dxi, while
Stata by default shows discrete effects deltaF/deltaxi. */

```

```

probit; lhs = diedLC; rhs = X; marginal effects $
matrix: b_LC = B $

```

```

probit; lhs = Par; rhs = X; marginal effects $
matrix: b_Par = B $

```

```

probit; lhs = PFT; rhs = X; marginal effects $
matrix: b_PFT = B $

```

```

/* Note change in RHS for anyPleu */
probit; lhs = anyPleu; rhs = Xo; marginal effects $
matrix: b_Ple = B $

```

```

/* Pairwise Bivariate probit models */

```

```

bivariate; lhs = diedLC, Par; rhs = X; rh2 = X;
start = b_LC, b_Par; marginal effects $
matrix: b_LC = part(B, 1, 8) $
calc; rhoLCPar = rho $

```

```

bivariate; lhs = Par, PFT; rhs = X; rh2 = X;
start = b_Par, b_PFT; marginal effects $
calc; rhoParPFT = rho $
bivariate; lhs = diedLC, PFT; rhs = X; rh2 = X;
start = b_LC, b_PFT; marginal effects $
calc; rhoLC_PFT = rho $

```

```

/* Note change in RHS for anyPleu */
bivariate; lhs = diedLC, anyPleu; rhs = X; rh2 = Xo;
start = b_LC, b_Ple; marginal effects $
calc; rhoLC_Ple = rho $

```

```

/* Note change in RHS for anyPleu */
bivariate; lhs = Par, anyPleu; rhs = X; rh2 = Xo;
start = b_Par, b_Ple; marginal effects $
calc; rhoPar_Ple = rho $

```

```

/* Note change in RHS for anyPleu */
bivariate; lhs = PFT, anyPleu; rhs = X; rh2 = Xo;
start = b_PFT, b_Ple; marginal effects $
calc; rhoPFT_Ple = rho $

```

```

/* 4x4 Variance-covariance matrix for multivariate
normal calculations */
matrix: Omega4 = {1 /
rhoLCPar, 1 /
rhoLC_PFT, rhoParPFT, 1 /
rhoLC_Ple, rhoPar_Ple, rhoPFT_Ple, 1} $

```

```

/* 3x3 Variance-covariance submatrix for multivariate
normal calculations */
matrix: Omega3 = part(Omega4, 1, 3, 1, 3) $

```

```

/* Computation of indices XB at (baseline) means of X
from probit models */
matrix: y_LC = X_BL'b_LC $
matrix: y_Par = X_BL'b_Par $
matrix: y_PFT = X_BL'b_PFT $
/* Note change in code for pleural */
matrix: y_Ple = Xo_BL'b_Ple $

```

```

/* Counterfactual values of indices (past) - no post-2000 misconduct */
matrix: y_LC_p = y_LC - 0.90*part(b_LC,2,2,1,1) $
matrix: y_LC_phi = y_LC - 0.90*part(b_LC,2,2,1,1) $
matrix: y_LC_plo = y_LC - 0.90*part(b_LC,2,2,1,1) $
matrix: y_Pa_p = y_Par - 0.90*part(b_Par,2,2,1,1) $
matrix: y_Pa_phi = y_Par - 0.90*part(b_Par,2,2,1,1) $
matrix: y_Pa_plo = y_Par - 0.90*part(b_Par,2,2,1,1) $
matrix: y_PFT_p = y_PFT - 0.90*part(b_PFT,2,2,1,1) $
matrix: y_PFT_phi = y_PFT - 0.90*part(b_PFT,2,2,1,1) $
matrix: y_PFT_plo = y_PFT - 0.90*part(b_PFT,2,2,1,1) $

```

```

/* Note change in code for pleural disease */
matrix: y_Pl_p = y_Ple $
matrix: y_Pl_phi = y_Ple $
matrix: y_Pl_plo = y_Ple $

```

```

/* Counterfactual values of indices (future) - no post-2000 misconduct */

```



```

matrix: z0 = (y_LC / y_Pa_P / y_Pl_P) $
matrix: z1 = (y_LC_P / y_Pa_P / y_Pl_P) $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p41_P = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_LC $

matrix: z0 = (y_LC / y_Pa_Plo / y_Pl_Plo) $
matrix: z1 = (y_LC_Plo / y_Pa_Plo / y_Pl_Plo) $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p41_Plo = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_LC $

matrix: z0 = (y_LC / y_Pa_Phi / y_Pl_Phi) $
matrix: z1 = (y_LC_Phi / y_Pa_Phi / y_Pl_Phi) $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p41_Phi = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_LC $

matrix: z0 = (y_LC / y_Pa_f / y_Pl_f) $
matrix: z1 = (y_LC_f / y_Pa_f / y_Pl_f) $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p41_f = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_LC $

matrix: z0 = (y_LC / y_Pa_flo / y_Pl_flo) $
matrix: z1 = (y_LC_flo / y_Pa_flo / y_Pl_flo) $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p41_flo = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_LC $

matrix: z0 = (y_LC / y_Pa_fhi / y_Pl_fhi) $
matrix: z1 = (y_LC_fhi / y_Pa_fhi / y_Pl_fhi) $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p41_fhi = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_LC $

/* Collect results and clean up. */
matrix: p(4,1) = p41_P $
matrix: p(4,2) = p41_Plo $
matrix: p(4,3) = p41_Phi $
matrix: p(4,4) = p41_f $
matrix: p(4,5) = p41_flo $
matrix: p(4,6) = p41_fhi $
calc: delete p41_P, p41_Plo, p41_Phi $
calc: delete p41_f, p41_flo, p41_fhi $

/* Probability of Not Getting DBID but getting Non-Disabling
   BID in CF (no LC, Par but No PFT) */
/* Use original omega3 submatrix */
matrix: Omega3 = Part(Omega4, 1, 3, 1, 3) $
/* Sign matrix on order restrictions */
matrix: T = (-1, 0, 0, 1, 0, 0, 0, 1) $
matrix: Omega3A = T*Omega3 $
matrix: z = (y_LC / y_Par / y_PFT) $
matrix: zA = T*2 $
/* Probability of DBID and not LC in BL */
calc: p_DBID = Mvn(zA, Omega3A) $

/* Probability of still getting DBID in CF */
/* Probability of getting only NBID but not DBID in CF */
matrix: z = (y_LC / y_Pa_P / y_PFT) $
matrix: zA = T*21 $
calc: p_Cf = Mvn(zA, Omega3A) / p_DBID $

```

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```

matrix: z0 = (y_LC / y_Pa_P / y_PFT) $
matrix: z0A = T*20 $
calc: p32_P = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_DBID $

matrix: z0 = (y_LC / y_Pa_Plo / y_PFT) $
matrix: z0A = T*20 $
calc: p32_Plo = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_DBID $

matrix: z0 = (y_LC / y_Pa_Phi / y_PFT) $
matrix: z0A = T*20 $
calc: p32_Phi = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_DBID $

matrix: z0 = (y_LC / y_Pa_f / y_PFT) $
matrix: z0A = T*20 $
calc: p32_f = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_DBID $

matrix: z0 = (y_LC / y_Pa_flo / y_PFT) $
matrix: z0A = T*20 $
calc: p32_flo = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_DBID $

matrix: z0 = (y_LC / y_Pa_fhi / y_PFT) $
matrix: z0A = T*20 $
calc: p32_fhi = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_DBID $

/* Collect results and clean up. */
matrix: p(2,2) = p32_P $
matrix: p(2,3) = p32_Plo $
matrix: p(2,4) = p32_Phi $
matrix: p(2,5) = p32_f $
matrix: p(2,6) = p32_flo $
matrix: p(2,7) = p32_fhi $
calc: delete p32_P, p32_Plo, p32_Phi $
calc: delete p32_f, p32_flo, p32_fhi $

matrix: p(3,2) = p32_P $
matrix: p(3,3) = p32_Plo $
matrix: p(3,4) = p32_Phi $
matrix: p(3,5) = p32_f $
matrix: p(3,6) = p32_flo $
matrix: p(3,7) = p32_fhi $
calc: delete p32_P, p32_Plo, p32_Phi $
calc: delete p32_f, p32_flo, p32_fhi $

/* Probability of getting only pleural in CF given
   DBID in BL */
/* Use Omega4 matrix */
matrix: T = (-1, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1) $
matrix: Omega4A = T*Omega4 $

```



Ms8a\_R2\_r2.1im

```
matrix: z1A = T*z1 $
calc: p43_fhi = Mvn(z1A.Omega3A) / p_NBID $

/* Collect results and clean up. */
matrix: P_p(4,3) = p43_p $
matrix: P_plo(4,3) = p43_plo $
matrix: P_phi(4,3) = p43_phi $
matrix: P_f(4,3) = p43_f $
matrix: P_flo(4,3) = p43_flo $
matrix: P_fhi(4,3) = p43_fhi $
calc: delete p43_p, p43_plo, p43_phi $
calc: delete p43_f, p43_flo, p43_fhi $

/* Probability of pleural injury in BL */
/* Recreate 3x3 submatrix of Omega that gives only
   correlations of LC, Par, and Pl */
matrix: Omega3 = 11 /
  rhoLCPar, 1 /
  rhoLCple, rhoParPl, 1) $
matrix: T = [-1,0,0 / 0,-1,0 / 0,0,1] $
matrix: Omega3A = T*Omega3*T $
matrix: z0 = [Y_LC / Y_Par / Y_Ple] $
matrix: z0A = T*z0 $
calc: p_Pl = Mvn(z0A, Omega3A) $

/* Probability of Pl in CF given Pl in BL */
matrix: z1 = [Y_LC / Y_Par / Y_Pl_plo] $
matrix: z1A = T*z1 $
calc: p44_plo = Mvn(z1A, Omega3A) / p_Pl $

matrix: z1 = [Y_LC / Y_Par / Y_Pl_phi] $
matrix: z1A = T*z1 $
calc: p44_phi = Mvn(z1A, Omega3A) / p_Pl $

matrix: z1 = [Y_LC / Y_Par / Y_Pl_f] $
matrix: z1A = T*z1 $
calc: p44_f = Mvn(z1A, Omega3A) / p_Pl $

matrix: z1 = [Y_LC / Y_Par / Y_Pl_flo] $
matrix: z1A = T*z1 $
calc: p44_flo = Mvn(z1A, Omega3A) / p_Pl $

matrix: z1 = [Y_LC / Y_Par / Y_Pl_fhi] $
matrix: z1A = T*z1 $
calc: p44_fhi = Mvn(z1A, Omega3A) / p_Pl $

/* Collect results and clean up. */
matrix: P_p(4,4) = p44_p $
matrix: P_plo(4,4) = p44_plo $
matrix: P_phi(4,4) = p44_phi $
matrix: P_f(4,4) = p44_f $
matrix: P_flo(4,4) = p44_flo $
matrix: P_fhi(4,4) = p44_fhi $
```

tab 73, p. 1

produced by RJRTC  
in  
HUMPHREY

Dm5\_ms8a\_R2\_r2.do

```

* @RM500
* DHS: Computation of present discounted value (PDV)
* of 'past' non-PDQ resolved and unresolved claims.
* Input files: lv6; 'Risk Free Interest Rate'
* This version is used ms7a as input file. No effect on program
* Program modifies DM3
clear
drop _all
set msng off
set more off
set matsize 500

log using dm5_ms7a, replace

* (0) Liquidated value of unresolved claims (based on TDP)
* from 'MatrixREV95.xls\Unresolved:
matrix U = (48400, 25400, 51500, 12500)
matrix colnames U = LC NBID DBID PI
matrix rownames U = LiqVal

* Administrative costs per claim from 'MatrixREV95.xls\admin_costs
matrix C = (577 \ 210 )
matrix rownames C = past unres
matrix colnames C = ad_cost
matrix li C

* (1) Compute discount factors
use Risk Free Interest Rate
* Drop 1988-1991 'Courts' Preliminary Orders cover only 1992.*)
drop in 1/4
qui gen n = 2000 - _n
sort n
gen dFactor = 1 in 1
qui replace dF = dF[_n-1]*(1 - I/100) in 2/3
form dF %9.3f
sort y
drop n 1

* (2) Merge with lv6; incl. admin costs and unresolved claims
merge year using lv6
drop _m

* Estimated Liquidated Values of Unresolved Claims
qui replace VR_LC = U[1,1] if y == 2000
qui replace VS_LC = U[1,1] if y == 2000
qui replace VR_NBID = U[1,2] if y == 2000
qui replace VS_NBID = U[1,2] if y == 2000
qui replace VR_DBID = U[1,3] if y == 2000
qui replace VS_DBID = U[1,3] if y == 2000
qui replace VR_PI = U[1,4] if y == 2000
qui replace VS_PI = U[1,4] if y == 2000

* Add admin costs of past resolved claims to LiqVals
qui replace VR_LC = VR_LC + C[1,1] if y < 2000
qui replace VR_NBID = VR_NBID + C[1,1] if y < 2000
qui replace VR_DBID = VR_DBID + C[1,1] if y < 2000
qui replace VR_PI = VR_PI + C[1,1] if y < 2000
qui replace VS_LC = VS_LC + C[1,1] if y < 2000
qui replace VS_NBID = VS_NBID + C[1,1] if y < 2000
qui replace VS_DBID = VS_DBID + C[1,1] if y < 2000
qui replace VS_PI = VS_PI + C[1,1] if y < 2000

* Add admin costs to unresolved claims to LiqVals
qui replace VR_LC = VR_LC + C[2,1] if y == 2000
qui replace VR_NBID = VR_NBID + C[2,1] if y == 2000
qui replace VR_DBID = VR_DBID + C[2,1] if y == 2000
qui replace VR_PI = VR_PI + C[2,1] if y == 2000
qui replace VS_LC = VS_LC + C[2,1] if y == 2000
qui replace VS_NBID = VS_NBID + C[2,1] if y == 2000
qui replace VS_DBID = VS_DBID + C[2,1] if y == 2000
qui replace VS_PI = VS_PI + C[2,1] if y == 2000

* (3) Compute PDV of Liq Val + Admin Costs by Dx and Year
qui replace VR_LC = VR_LC * dF
qui replace VR_NBID = VR_NBID * dF
qui replace VR_DBID = VR_DBID * dF
qui replace VR_PI = VR_PI * dF
qui replace VS_LC = VS_LC * dF
qui replace VS_NBID = VS_NBID * dF
qui replace VS_DBID = VS_DBID * dF
qui replace VS_PI = VS_PI * dF
drop dF

* (4) Convert to matrices (Note: Order needs to be conformal with
* order of rows in subdiagonal P-matrices in ms7a and ms7)
* RICO
qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_PI = 0 if VR_PI == .
mkmat VR_LC
mkmat VR_NBID
mkmat VR_DBID
mkmat VR_PI
matrix YR = VR_LC, VR_DBID, VR_NBID, VR_PI
matrix drop VR_LC VR_NBID VR_DBID VR_PI
matrix colnames YR = LC DBID NBID PI
matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VR, format(%8.0f) title("RICO Claims by Dx Year")

qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_PI = 0 if VR_PI == .
mkmat VR_LC
mkmat VR_NBID
mkmat VR_DBID
mkmat VR_PI
matrix VR = VR_LC, VR_DBID, VR_NBID, VR_PI
matrix drop VR_LC VR_NBID VR_DBID VR_PI
matrix colnames VR = LC DBID NBID PI
matrix rownames VR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VR, format(%8.0f) title("RICO PDV LiqVal+AdminCost by Dx Year")

* SFA
qui replace VS_LC = 0 if VS_LC == .
qui replace VS_NBID = 0 if VS_NBID == .
qui replace VS_DBID = 0 if VS_DBID == .
qui replace VS_PI = 0 if VS_PI == .
mkmat VS_LC
mkmat VS_NBID
mkmat VS_DBID
mkmat VS_PI
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_PI
matrix drop VS_LC VS_NBID VS_DBID VS_PI
matrix colnames VS = LC DBID NBID PI
matrix rownames VS = LC DBID NBID PI

```



```

* (0) Liquidated value of unresolved claims (based on TDP)
* from [MatrixREV95.xls|Unresolved:
matrix U = {R4400, 25400, 51500, 12500}
matrix colnames U = LC NBID DBID PI
matrix rownames U = LiqVal

* Administrative costs per claim from [MatrixREV95.xls|admin_costs
matrix C = {577 \ 210 }
matrix rownames C = past unres
matrix colnames C = ad_cost

matrix li C
C(2,1)
ad_cost
past 577
unres 210

* (1) Compute discount factors
use Risk Free Interest Rate

* Drop 1998, 1991 (Courts' Preliminary Orders cover only 1992*)
drop in 1/4
(* observations deleted)

qui gen n = 2000 - _n
sort n

gen dFactor = 1 in 1
* missing values generated)
qui replace dF = dF[_n-1]*(1 + I/100) in 2/9
form dF %9.3f

sort y
drop n 1
1

year dFactor
1. 1992 1.418
2. 1993 1.370
3. 1994 1.331
4. 1995 1.281
5. 1996 1.213
6. 1997 1.153
7. 1998 1.096
8. 1999 1.045
9. 2000 1.000

* (2) Merge with lv6: incl. admin costs and unresolved claims
merge year using lv6

* (3) Compute PDV of Liq Val + Admin Costs by Dx and Year
qui replace VR_LC = VR_LC + dF
qui replace VR_NBID = VR_NBID + dF
qui replace VR_DBID = VR_DBID + dF

```



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```

qui replace VR_P1 = VR_P1 * dF
qui replace VS_LC = VS_LC * dF
qui replace VS_NBID = VS_NBID * dF
qui replace VS_DBID = VS_DBID * dF
qui replace VS_P1 = VS_P1 * dF
drop dF

```

\* (4) Convert to matrices (Note: Order needs to be conformal with order of rows in subdiagonal P-matrices in ms7a and ms7)

```

* RICO
qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_P1 = 0 if VR_P1 == .

```

mkmat VR\_LC

mkmat VR\_NBID

mkmat VR\_DBID

mkmat VR\_P1

matrix YR = VR\_LC, VR\_DBID, VR\_NBID, VR\_P1

matrix drop YR\_LC YR\_NBID YR\_DBID YR\_P1

matrix colnames YR = LC DBID NBID P1

matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000

matrix li YR, format(%8.0f) title("RICO Claims by Dx Year")

```

VR{9.4}: RICO Claims by Dx Year
LC DBID NBID P1
1992 0 0 0 0
1993 0 0 0 0
1994 0 0 0 0
1995 0 0 0 0
1996 0 0 0 0
1997 0 0 0 0
1998 0 0 0 0
1999 0 0 0 0
2000 0 0 0 0

```

qui replace VR\_LC = 0 if VR\_LC == .

qui replace VR\_NBID = 0 if VR\_NBID == .

qui replace VR\_DBID = 0 if VR\_DBID == .

qui replace VR\_P1 = 0 if VR\_P1 == .

mkmat VR\_LC

mkmat VR\_NBID

mkmat VR\_DBID

mkmat VR\_P1

matrix YR = VR\_LC, VR\_DBID, VR\_NBID, VR\_P1

matrix drop YR\_LC YR\_NBID YR\_DBID YR\_P1

matrix colnames YR = LC DBID NBID P1

matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000

matrix li YR, format(%8.0f) title("RICO PDV LiqVal+AdmCost by Dx Year")

VR{9.4}: RICO PDV LiqVal+AdmCost by Dx Year

```

LC DBID NBID P1
1992 0 0 0 0
1993 0 0 0 0
1994 0 0 0 0
1995 0 0 0 0
1996 106213 61370 31035 15261
1997 101419 58751 29730 14549
1998 96865 55924 28138 13853
1999 92414 52990 26774 12980
2000 88610 51710 25610 12710

```

\* SFA

qui replace YS\_LC = 0 if YS\_LC == .

qui replace YS\_NBID = 0 if YS\_NBID == .

qui replace YS\_DBID = 0 if YS\_DBID == .

qui replace YS\_P1 = 0 if YS\_P1 == .

mkmat YS\_LC

mkmat YS\_NBID

mkmat YS\_DBID

mkmat YS\_P1

matrix YS = YS\_LC, YS\_DBID, YS\_NBID, YS\_P1

matrix drop YS\_LC YS\_NBID YS\_DBID YS\_P1

matrix colnames YS = LC DBID NBID P1

matrix rownames YS = 1992 1993 1994 1995 1996 1997 1998 1999 2000

matrix li YS, format(%8.0f) title("SFA Claims by Dx Year")

```

YS{9.4}: SFA Claims by Dx Year
LC DBID NBID P1
1992 14 1 0 0
1993 17 2 0 0
1994 555 6 3 0
1995 933 44 30 21
1996 1612 1003 3356 3722
1997 2405 4262 7262 5453

```

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```

1998 2111 3967 6992 5907
1999 2653 22284 35603 12023
2000 3685 20135 30318 13653

```

```

qui replace VS_LC = 0 if VS_LC == .

```

```

qui replace VS_NBID = 0 if VS_NBID == .

```

```

qui replace VS_DBID = 0 if VS_DBID == .

```

```

qui replace VS_P1 = 0 if VS_P1 == .

```

```

mkmat VS_LC

```

```

mkmat VS_DBID

```

```

mkmat VS_NBID

```

```

mkmat VS_P1

```

```

matrix VS = VS_LC, VS_DBID, VS_NBID, VS_P1

```

```

matrix drop VS_LC VS_NBID VS_DBID VS_P1

```

```

matrix colnames VS = LC DBID NBID P1

```

```

matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000

```

```

matrix li VS, format(%8.0f) title("SFA PDV LiqVal*AdmCost by Dx Year")

```

```

VS(2,4): SFA PDV LiqVal*AdmCost by Dx Year

```

	LC	DBID	NBID	P1
1992	159788	71719	818	818
1993	131377	69287	790	790
1994	115516	72882	34051	768
1995	113591	69612	33136	16613
1996	106310	52012	31374	15464
1997	101849	59378	30011	14811
1998	97037	56279	28231	13909
1999	92715	52772	26779	12661
2000	88610	51710	25610	12710

```

* (4) Get P-matrix from ms7a

```

```

* Note: This file has a slightly format than c1 (as used in dm1)

```

```

drop _all

```

```

use ms8a_r2_12

```

```

* Use only past estimates of P-matrix

```

```

keep if Era == 0

```

```

* observations deleted

```

```

l.nod

```

	Era	Range	p11	p21	p32	p11	p22	p31	p32
1.	19986	0.0090	Lo	0.9467	0.0177	p43	p44	0.0229	0.0102
2.	19886	0.0090	Med	0.9467	0.0177	p43	p44	0.0229	0.0102
3.	19886	0.0090	Hi	0.9467	0.0177	p43	p44	0.0229	0.0102

```

* Loop through (low,med,high) (n = 1,2,3)
qui gen double PDV_RICO = .

```

```

* gen double PDV_RICO = .

```

```

* PDV_RICO = 99.1 if

```

```

* matrix = J(4,4,0)

```

```

* prog def getPDV

```

```

1. global n = 1

```

```

2. while Sn <= 3 {

```

```

3. matrix P(1,1) = p11[Sn]

```

```

4. matrix P(2,1) = p21[Sn]

```

```

5. matrix P(2,2) = p22[Sn]

```

```

6. matrix P(3,1) = p31[Sn]

```

```

7. matrix P(3,2) = p32[Sn]

```

```

8. matrix P(3,3) = p33[Sn]

```

```

9. matrix P(4,1) = p41[Sn]

```

```

10. matrix P(4,2) = p42[Sn]

```

```

11. matrix P(4,3) = p43[Sn]

```

```

12. matrix P(4,4) = p44[Sn]

```

```

13. di "case: ", Sn

```

```

14. matrix li P

```

```

15. * Compute PDV for both RICO & SFA

```

```

16. matrix DR = trace(VR * (I(4) - P) * VR')

```

```

17. qui replace PDV_RICO = DR(1,1)/1e6 in Sn

```

```

18. matrix DS = trace(VS * (I(4) - P) * VS')

```

```

19. qui replace PDV_SPA = DS(1,1)/1e6 in Sn

```

```

20. * Save results in median case (n=2) for graphs and tables

```

```

21. if Sn == 2 {

```

```

22. * FR and FS are annual financial injury from RICO and SFA

```

```

23. matrix FR = vecdiag(VR * (I(4) - P) * VR')

```

```

24. matrix FS = vecdiag(VS * (I(4) - P) * VS')

```

```

25. matrix FR = FR'

```

```

26. matrix FS = FS'

```

```

27. * ZR and ZS are annual claims by Dx in counterfactual scenario (median cas

```

```

28. matrix ZR = P * VR'

```

```

29. matrix ZS = P * VS'

```

```

30. matrix ZR = ZR'

```

```

31. matrix ZS = ZS'

```

```

32. )

```

```

33. global n = Sn + 1

```

```

34. }

```

```

35. end

```

```

* getPDV

```

```

case: 1

```

```

P(4,4)

```

```

c1 c2 c3 c4

```

```

r1 .94669998 0 0 0

```

```

r2 .0177 .98030001 0 0

```

```

r3 .0229 .0102 .98860002 0

```

```

r4 .009 .008 .0074 1

```

```

case: 2

```

```

P(4,4)

```

```

c1 c2 c3 c4

```

```

r1 .94669998 0 0 0

```

```

r2 .0177 .98030001 0 0

```

```

r3 .0229 .0102 .98860002 0

```

```

r4 .009 .008 .0074 1

```

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```

r4 .009 .008 .0074 1
case: 3
F(4,4) c1 c2 c3
1 .9466998 0 0
2 .0177 .9403001 0
3 .0239 .0102 .9860002 0
4 .009 .008 .0074 1

```

1 Era Range PDV\_R PDV\_S.nod

```

Era Range PDV_RICO PDV_SFA
1. Past Lo 60.3 100.4
2. Past Med 60.3 100.4
3. Past Hi 60.3 100.4

```

\* Display results for median case for graphs and tables

drop \_all

\* Financial injury by year  
 smat FR  
 number of observations will be reset to 9  
 Press any key to continue, or Break to abort

obs was 0, now 9

smat FS

qui replace FR = FR le6

qui replace FS = FS le6

gen int year = \_n + 1991

smat ZR

ren ZR1 ZR\_LC

ren ZR2 ZR\_DBID

ren ZR3 ZR\_NBID

ren ZR4 ZR\_F1

smat ZS

ren ZS1 ZS\_LC

ren ZS2 ZS\_DBID

ren ZS3 ZS\_NBID

ren ZS4 ZS\_F1

order y FR FS ZR\* ZS\*

form P\* Z\* FR,OT

1 y F\*.nod

```

Year FR1 FS1
1. 1992 0 0
2. 1993 0 0

```

Produced by RJRTC

1 y F\*.nod

Year	ZR_F1	ZR_LC	ZR_DBID	ZR_NBID	ZR_F1	ZS_LC	ZS_DBID	ZS_
1992	0	0	0	0	0	13	1	
1993	0	0	0	0	0	16	2	
1994	0	0	0	0	0	525	16	
1995	0	0	0	0	0	883	60	
1996	3769	807	604	1177	46	1526	1012	
1997	5562	1333	2364	3836	1045	2277	4221	
1998	5005	2144	16140	24060	3871	1998	3926	
1999	72489	2402	25109	24519	8621	2512	21892	3
2000	14072				11005	3489	19804	3

save Claims\_F.replace  
 (Note: file Claims\_P.dta not found)  
 file Claims\_P.dta saved

log close

go to:  
 tab 73, p. 4 (formatted)  
 view 3, p. 4 for 14

Water changes

remove asbestos specific quit and initiation rate effects (see p.15, 26 this tab)  
 past IR, past QR

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Computers Tds73, p5

nir5\_r2.do

```

* @RM500
* nir5: BL-CF differences in proportion of ever-smokers and
*   mean smoke-years exposure of claimants in HRA audit files
*   Relative risk initiation model hc(t) = exp(hc(t) * year)
*   hc(t) = r2-hb(t) if year >= T2, where T2 = T1
*   hc(t) = r2-hb(t) if year >= T3, where T3 = T1
*   (R3 can be any value, not just 1; T3 can be any value, not just 1999)
*   Age distribution for future claimants from age9.dta
*   Baseline cumulative smoking initiation curve from nir3.dta
*   Crossover insulators excluded

* Scenario pre-PM misconduct Estimate
*   BL 1.0 1.0
*   CF low 1.0 0.8
*   CF mid 0.9 0.7
*   CF high 0.8 0.6

*   Clear
*   drop _all
*   set tmsg off
*   set more off
*   set matsize 200

log using nir5, replace

* (1) get distribution of birth year of all claimants from age9.dta
use age9
keep year AllFutur
mkmat year AllFutur
matrix pi = year.AllFutur
matrix drop year AllFutur
* m = number of rows of pi
* col 1 (year t1, col 2(pi(t)))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi

* No correction here for year first exposed to asbestos
* (Comparison of output of nir2 and nir3 shows little effect)

* (2) Get baseline cumulative initiation curve from nir3.dta
drop _all
use nir3_r2
gen SB = 1 - FB
lab var x "Age"

* (3) Computation of initiation rates in CF scenario
* Cutoff years for decrease in initiation rates are T1, max(ST2, V1exp), max(ST3, V1exp)
* Relative decrease in initiation rate (on or after year T1) is global variable $r1
* Relative decrease in initiation rate (on or after max(T2, V1exp)) is global variable $
* Relative decrease in initiation rate (on or after max(T3, V1exp)) is global variable $
* Note: $r3 >= $r2 >= $r1

*   $r1 = obs# at age at T1
*   local u1 = 'x1' - $xMin
*   local v1 = 'x1' - $xMin + 1
*   $r2 = obs# at age at T2
*   local u2 = 'x2' - $xMin
*   local v2 = 'x2' - $xMin + 1
*   $r3 = obs# at age at T3
*   local u3 = 'x3' - $xMin
*   local v3 = 'x3' - $xMin + 1
*   Note: u3 >= u2 >= u1
*   local A1 = SB[u1, u1]^(1-$r1)
*   local A2 = SB[u2, u2]^(1-$r2)

*   Compute SB(x)^r1 SB(x)^r2 SB(x)^r3
*   qui replace SBR1 = SB^$r1
*   qui replace SBR2 = SB^$r2
*   qui replace SBR3 = SB^$r3
*   qui replace SC = 0
*   Compute SC = SUM(t) pi(t) * SB(x)^r2 * SB(min(x, T1-t))^(1-$r1) * SB(min(x, T2-t))^(1-$r2) * SB(min
n(x, T3-t))^(1-$r3) for all x
* Sum over index 'i' (rows of pi)
local i = 1
while 'i' <= Sm (
    local t = pi[i, 1]
    local p = pi[i, 2]
    'x1' = age at T1
    local x1 = ST1 - 't'
    'x2' = age at T2
    local x2 = min(ST2 - 't', $xMax)
    'x3' = age at T3
    local x3 = min(ST3 - 't', $xMax)
    Note: x3 >= x2 >= x1
    'v1' = obs# at age at T1
    local u1 = 'x1' - $xMin
    local v1 = 'x1' - $xMin + 1
    'v2' = obs# at age at T2
    local u2 = 'x2' - $xMin
    local v2 = 'x2' - $xMin + 1
    'v3' = obs# at age at T3
    local u3 = 'x3' - $xMin
    local v3 = 'x3' - $xMin + 1
    Note: u3 >= u2 >= u1
    local A1 = SB[u1, u1]^(1-$r1)
    local A2 = SB[u2, u2]^(1-$r2)

```

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```

nir5_r2.do
local A3 = SB["u3"]*(S+r3)
DEBBUGING
di "i = 'i', t = 't', x1.x2.x3 = 'x1', 'x2', 'x3', u2.u3 = 'u1', 'u2', u3"
v1.v2.v3 = 'v1', 'v2', 'v3'
Null Case:
if 'x1' >= S*Max {
DEBBUGING
di "Null case"
qui replace SC = SC + 'p' * SB
}
else {
if 'u3' <= 0 {
Case A: 'u1' <= 0 & 'u2' <= 0 & 'u3' <= 0
DEBBUGING
di "Case A"
qui replace SC = SC + 'p' * SBr3
}
else {
if 'u3' > 0 & 'u2' <= 0 {
di "Case B"
Case B: 'u1' <= 0 & 'u2' <= 0 & 'u3' > 0
DEBBUGING
qui replace SC = SC + 'p' * SBr2 in 1/'u3'
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A3' in 'v3'/'SN'
}
}
else {
if 'u2' > 0 & 'u1' <= 0 {
Case C: 'u1' <= 0 & 'u2' > 0 & 'u3' > 0
DEBBUGING
di "Case C"
qui replace SC = SC + 'p' * SBr1 in 1/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A2' * 'A3' in 'v3'/'SN'
}
}
else {
Case D: 'u1' > 0 & 'u2' > 0 & 'u3' > 0
DEBBUGING
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'SN'
}
}
}
}
}
local i = 'i' + 1
}
- Lifetime probability of not smoking by age S*Max in CF scenario
global PC = SC[SN]
- Conditional survival curve in CF scenario
tempvar SC_
qui gen 'SC_' = 1 - (1 - SC)/(1 - SPC)
qui sum 'SC_'

```

```

* Mean age started among those starting by age $xMax in CF scenario
Global XC = $xMin + r(mean)*$N
di @ 0.7 of $T1, $T2, $T3, $T4, $T5, $T6, $T7, $T8, $T9, $T10, $T11, $T12, $T13, $T14, $T15, $T16, $T17, $T18, $T19, $T20, $T21, $T22, $T23, $T24, $T25, $T26, $T27, $T28, $T29, $T30, $T31, $T32, $T33, $T34, $T35, $T36, $T37, $T38, $T39, $T40, $T41, $T42, $T43, $T44, $T45, $T46, $T47, $T48, $T49, $T50, $T51, $T52, $T53, $T54, $T55, $T56, $T57, $T58, $T59, $T60, $T61, $T62, $T63, $T64, $T65, $T66, $T67, $T68, $T69, $T70, $T71, $T72, $T73, $T74, $T75, $T76, $T77, $T78, $T79, $T80, $T81, $T82, $T83, $T84, $T85, $T86, $T87, $T88, $T89, $T90, $T91, $T92, $T93, $T94, $T95, $T96, $T97, $T98, $T99, $T100, $T101, $T102, $T103, $T104, $T105, $T106, $T107, $T108, $T109, $T110, $T111, $T112, $T113, $T114, $T115, $T116, $T117, $T118, $T119, $T120, $T121, $T122, $T123, $T124, $T125, $T126, $T127, $T128, $T129, $T130, $T131, $T132, $T133, $T134, $T135, $T136, $T137, $T138, $T139, $T140, $T141, $T142, $T143, $T144, $T145, $T146, $T147, $T148, $T149, $T150, $T151, $T152, $T153, $T154, $T155, $T156, $T157, $T158, $T159, $T160, $T161, $T162, $T163, $T164, $T165, $T166, $T167, $T168, $T169, $T170, $T171, $T172, $T173, $T174, $T175, $T176, $T177, $T178, $T179, $T180, $T181, $T182, $T183, $T184, $T185, $T186, $T187, $T188, $T189, $T190, $T191, $T192, $T193, $T194, $T195, $T196, $T197, $T198, $T199, $T200, $T201, $T202, $T203, $T204, $T205, $T206, $T207, $T208, $T209, $T210, $T211, $T212, $T213, $T214, $T215, $T216, $T217, $T218, $T219, $T220, $T221, $T222, $T223, $T224, $T225, $T226, $T227, $T228, $T229, $T230, $T231, $T232, $T233, $T234, $T235, $T236, $T237, $T238, $T239, $T240, $T241, $T242, $T243, $T244, $T245, $T246, $T247, $T248, $T249, $T250, $T251, $T252, $T253, $T254, $T255, $T256, $T257, $T258, $T259, $T260, $T261, $T262, $T263, $T264, $T265, $T266, $T267, $T268, $T269, $T270, $T271, $T272, $T273, $T274, $T275, $T276, $T277, $T278, $T279, $T280, $T281, $T282, $T283, $T284, $T285, $T286, $T287, $T288, $T289, $T290, $T291, $T292, $T293, $T294, $T295, $T296, $T297, $T298, $T299, $T300, $T301, $T302, $T303, $T304, $T305, $T306, $T307, $T308, $T309, $T310, $T311, $T312, $T313, $T314, $T315, $T316, $T317, $T318, $T319, $T320, $T321, $T322, $T323, $T324, $T325, $T326, $T327, $T328, $T329, $T330, $T331, $T332, $T333, $T334, $T335, $T336, $T337, $T338, $T339, $T340, $T341, $T342, $T343, $T344, $T345, $T346, $T347, $T348, $T349, $T350, $T351, $T352, $T353, $T354, $T355, $T356, $T357, $T358, $T359, $T360, $T361, $T362, $T363, $T364, $T365, $T366, $T367, $T368, $T369, $T370, $T371, $T372, $T373, $T374, $T375, $T376, $T377, $T378, $T379, $T380, $T381, $T382, $T383, $T384, $T385, $T386, $T387, $T388, $T389, $T390, $T391, $T392, $T393, $T394, $T395, $T396, $T397, $T398, $T399, $T400, $T401, $T402, $T403, $T404, $T405, $T406, $T407, $T408, $T409, $T410, $T411, $T412, $T413, $T414, $T415, $T416, $T417, $T418, $T419, $T420, $T421, $T422, $T423, $T424, $T425, $T426, $T427, $T428, $T429, $T430, $T431, $T432, $T433, $T434, $T435, $T436, $T437, $T438, $T439, $T440, $T441, $T442, $T443, $T444, $T445, $T446, $T447, $T448, $T449, $T450, $T451, $T452, $T453, $T454, $T455, $T456, $T457, $T458, $T459, $T460, $T461, $T462, $T463, $T464, $T465, $T466, $T467, $T468, $T469, $T470, $T471, $T472, $T473, $T474, $T475, $T476, $T477, $T478, $T479, $T480, $T481, $T482, $T483, $T484, $T485, $T486, $T487, $T488, $T489, $T490, $T491, $T492, $T493, $T494, $T495, $T496, $T497, $T498, $T499, $T500, $T501, $T502, $T503, $T504, $T505, $T506, $T507, $T508, $T509, $T510, $T511, $T512, $T513, $T514, $T515, $T516, $T517, $T518, $T519, $T520, $T521, $T522, $T523, $T524, $T525, $T526, $T527, $T528, $T529, $T530, $T531, $T532, $T533, $T534, $T535, $T536, $T537, $T538, $T539, $T540, $T541, $T542, $T543, $T544, $T545, $T546, $T547, $T548, $T549, $T550, $T551, $T552, $T553, $T554, $T555, $T556, $T557, $T558, $T559, $T560, $T561, $T562, $T563, $T564, $T565, $T566, $T567, $T568, $T569, $T570, $T571, $T572, $T573, $T574, $T575, $T576, $T577, $T578, $T579, $T580, $T581, $T582, $T583, $T584, $T585, $T586, $T587, $T588, $T589, $T590, $T591, $T592, $T593, $T594, $T595, $T596, $T597, $T598, $T599, $T600, $T601, $T602, $T603, $T604, $T605, $T606, $T607, $T608, $T609, $T610, $T611, $T612, $T613, $T614, $T615, $T616, $T617, $T618, $T619, $T620, $T621, $T622, $T623, $T624, $T625, $T626, $T627, $T628, $T629, $T630, $T631, $T632, $T633, $T634, $T635, $T636, $T637, $T638, $T639, $T640, $T641, $T642, $T643, $T644, $T645, $T646, $T647, $T648, $T649, $T650, $T651, $T652, $T653, $T654, $T655, $T656, $T657, $T658, $T659, $T660, $T661, $T662, $T663, $T664, $T665, $T666, $T667, $T668, $T669, $T670, $T671, $T672, $T673, $T674, $T675, $T676, $T677, $T678, $T679, $T680, $T681, $T682, $T683, $T684, $T685, $T686, $T687, $T688, $T689, $T690, $T691, $T692, $T693, $T694, $
```

```
.....Wecker Change: replace 0.7 with 1.0.....
getSC 1954 1963 2001 0.9 0.7 1.0
getSC 1954 1963 2001 0.9 1.0 1.0
.....End Wecker Change.....
```

```

qui gen FC_ = 1 - SC
lab var FC_ "FC (no post-2000 Misconduct) mid est."
getSC 1954 1963 2001 0.9 0.7 0.7
q_ = gen FC7 = 1 - SC
lab var FC7 "FC (post-2000 Misconduct) mid est."
getSC 1954 1963 2001 0.9 0.6 1.0
getSC 1954 1963 2001 0.8 0.8 1.0
getSC 1954 1963 2001 0.8 0.7 1.0
getSC 1954 1963 2001 0.8 0.6 1.0
qui gen FC_hi = 1 - SC
lab var FC_hi "FC (no post-2000 Misconduct) high est."
getSC 1954 1963 2001 0.8 0.6 0.6
qui gen FC7_hi = 1 - SC
lab var FC7_hi "FC (post-2000 Misconduct) high est."

```

```

end
rangesC

qui gen FB = 1 - SB
* Graph results for T1,T2 = 1954,1963 r1,r2 = 0.9,0.6 vs. T2 = 1988, r2 = 0.6
gr FC_ = FB x.ylab(0,.25,.5,.75,1) xlab(10,20,30,40,50) s((iii)c(JJJ)) l1("Cumulative Proportion Who Have Begun to Smoke") saving(nir5a.replace)
gr FC_ = FB x.ylab(0,.25,.5,.75,1) xlab(10,20,30,40,50) s((iii)c(JJJ)) l1("Cumulative Proportion Who Have Begun to Smoke") saving(nir5b.replace)

Keep x F_
form x %6.0f
form F_ %7.3f
save nir5_r2, replace
* List data
l.nod

* Compute changes in proportion who ever smoked
global N = _N
* Baseline scenario:
dl %9.3f FB(SN)

```

```
prog def Results
di --- Decrease in proportion smoked
```

Low del Results		Middle		High	
di	Est.	di	Est.	di	Est.
di - Post-2000	Low	di - Post-2000	Low	di - Post-2000	Low
di - Misconduct	Low	di - Misconduct	Low	di - Misconduct	Low
di - Yes	-.12.3f FB(SN)	di - Yes	-.12.3f FB(SN)	di - Yes	-.12.3f FB(SN)
di - No	-.12.3f FB(SN)	di - No	-.12.3f FB(SN)	di - No	-.12.3f FB(SN)

25017 6.37  
10.4 - 10.5

# HUMPHREY

Produced by RJRTO

•

```
* (1) get distribution of birth year of all claimants from y9.dta
use age9
```

```
keep year AllFutur
```

```
mkmat year AllFutur
```

```
matrix pi = year, AllFutur
```

```
matrix drop year AllFutur
```

```
* m = number of rows of pi
* col 1 (year t), col 2 (pi(t))
matrix colnames pi = t pi(t)
```

```
global m = rowsof(pi)
```

```
matrix list pi
```

```
pi[72,2]
```

```

t      pi(t)
1900 .00004113
1901 .00002101
1902 .00003102
1903 .00004538
1904 .00005578
1905 .00009443
1906 .00013421
1907 .0001888
1908 .00026279
1909 .00036178
1910 .00049251
1911 .00066282
1912 .00088162
1913 .00115874
1914 .00150459
1915 .00192976
1916 .00244442
1917 .00305756
1918 .00377616
1919 .00460455
1920 .00554198
1921 .00658479
1922 .00772278
1923 .00894043
1924 .01021674
1925 .01152602
1926 .01287937
1927 .0142696
1928 .01569611
1929 .01652004
1930 .0175923
1931 .01858097
1932 .01950742
1933 .02041352
1934 .02136119
1935 .02242851
1936 .02370143
1937 .02526133
1938 .02716919
1939 .0294488
1940 .03206937
1941 .03493946

```

```

r43 1942 .03790151
r44 1943 .04074331
r45 1944 .04321814
r46 1945 .04501874
r47 1946 .04608416
r48 1947 .04650912
r49 1948 .04645017
r50 1949 .04289862
r51 1950 .03982827
r52 1951 .03601309
r53 1952 .03170149
r54 1953 .02716146
r55 1954 .0226488
r56 1955 .01838121
r57 1956 .01452142
r58 1957 .01117046
r59 1958 .00837014
r60 1959 .00611187
r61 1960 .00435152
r62 1961 .00303185
r63 1962 .00206251
r64 1963 .00137566
r65 1964 .00090207
r66 1965 .00058381
r67 1966 .00037486
r68 1967 .0002404
r69 1968 .00015518
r70 1969 .00010166
r71 1970 .0000681
r72 1971 .00017831

```

```
* No correction here for year first exposed to asbestos
* (Comparison of output of nir2 and nir3 shows little effect)
```

```
* (2) Get baseline cumulative initiation curve from nir3.dta
drop _all
```

```
use nir3_r2
```

```
gen SB = 1 - FB
```

```
lab var x "Age"
```

```
* (3) Computation of initiation rates in CF scenario
```

```
* Cutoff years for decrease in initiation rates are ST1, max(ST2, Y1exp), max(
```

```
> ST3, Y1exp)
```

```
* Relative decrease in initiation rate (on or after year T1) is global variab
```

```
> le Sri
```

```
* Relative decrease in initiation rate (on or after max(T2, Y1exp) ) is global
```

```
> variable $r2
```

```
* Relative decrease in initiation rate (on or after max(T3, Y1exp) ) is global
```

```
> variable $r3
```

```
* SB(x) cumulative proportion not smoking through age x in BL scenario.
```

```
keep x SB
```

```
sort x
```

```
order x SB
```

```
* Set xMax
```

```
* Age 50 set as cutoff for ever smoking
```

```
global xMax = 50
```

```

16. while 'i' <= $n {
17.   local t = pi('i',1)
18.   local p = pi('i',2)
19.   'x1' = age at T1
20.   local x1 = 'x1'
21.   local x2 = min($x1, $x2)
22.   local x3 = min($x1, $x2, $x3)
23.   local x3 = min($x1, $x2, $x3)
24.   Note: x3 >= x2 >= x1
25.   'v1' = obs# at age at T1
26.   local v1 = 'x1' - $xMin
27.   local v2 = 'x1' - $xMin + 1
28.   'v2' = obs# at age at T2
29.   local v2 = 'x2' - $xMin
30.   local v2 = 'x2' - $xMin + 1
31.   'v3' = obs# at age at T3
32.   local v3 = 'x3' - $xMin
33.   local v3 = 'x3' - $xMin + 1
34.   Note: v3 >= v2 >= v1
35.   local v3 = 'x3' - $xMin
36.   local v3 = 'x3' - $xMin + 1
37.   Note: v3 >= v2 >= v1
38.   local v3 = 'x3' - $xMin
39.   local v3 = 'x3' - $xMin + 1
40.   Note: v3 >= v2 >= v1
41.   local v3 = 'x3' - $xMin
42.   local v3 = 'x3' - $xMin + 1
43.   Note: v3 >= v2 >= v1
44.   local v3 = 'x3' - $xMin
45.   local v3 = 'x3' - $xMin + 1
46.   Note: v3 >= v2 >= v1
47.   local v3 = 'x3' - $xMin
48.   local v3 = 'x3' - $xMin + 1
49.   Note: v3 >= v2 >= v1
50.   local v3 = 'x3' - $xMin
51.   local v3 = 'x3' - $xMin + 1
52.   Note: v3 >= v2 >= v1
53.   local v3 = 'x3' - $xMin
54.   local v3 = 'x3' - $xMin + 1
55.   Note: v3 >= v2 >= v1
56.   local v3 = 'x3' - $xMin
57.   local v3 = 'x3' - $xMin + 1
58.   Note: v3 >= v2 >= v1
59.   local v3 = 'x3' - $xMin
60.   local v3 = 'x3' - $xMin + 1
61.   Note: v3 >= v2 >= v1
62.   local v3 = 'x3' - $xMin
63.   local v3 = 'x3' - $xMin + 1
64.   Note: v3 >= v2 >= v1
65.   local v3 = 'x3' - $xMin
66.   local v3 = 'x3' - $xMin + 1
67.   Note: v3 >= v2 >= v1
68.   local v3 = 'x3' - $xMin
69.   local v3 = 'x3' - $xMin + 1
70.   Note: v3 >= v2 >= v1
71.   local v3 = 'x3' - $xMin
72.   local v3 = 'x3' - $xMin + 1
73.   Note: v3 >= v2 >= v1
74.   local v3 = 'x3' - $xMin
75.   local v3 = 'x3' - $xMin + 1
76.   Note: v3 >= v2 >= v1
77.   local v3 = 'x3' - $xMin
78.   local v3 = 'x3' - $xMin + 1
79.   Note: v3 >= v2 >= v1
80.   local v3 = 'x3' - $xMin
81.   local v3 = 'x3' - $xMin + 1
82.   Note: v3 >= v2 >= v1
83.   local v3 = 'x3' - $xMin
84.   local v3 = 'x3' - $xMin + 1
85.   Note: v3 >= v2 >= v1
86.   local v3 = 'x3' - $xMin
87.   local v3 = 'x3' - $xMin + 1
88.   Note: v3 >= v2 >= v1
89.   local v3 = 'x3' - $xMin
90.   local v3 = 'x3' - $xMin + 1
91.   Note: v3 >= v2 >= v1
92.   local v3 = 'x3' - $xMin
93.   local v3 = 'x3' - $xMin + 1
94.   Note: v3 >= v2 >= v1
95.   local v3 = 'x3' - $xMin
96.   local v3 = 'x3' - $xMin + 1
97.   Note: v3 >= v2 >= v1
98.   local v3 = 'x3' - $xMin
99.   local v3 = 'x3' - $xMin + 1
100.  Note: v3 >= v2 >= v1

```



```

di "Case D"
qui replace SC = SC + 'p' * SB in i/'u1'
if 'v2' <= 'u3' {
    qui replace SC = SC + 'p' * SBr1 + 'A1' in i/'u2'
}
if 'v3' <= SN {
    qui replace SC = SC + 'p' * SBr3 + 'A1' * 'A2' * 'A3' in v3
}
end

local i = 1 , 1
70. Litterime probability of not smoking by age $xMax in CF scenario
global PC - SC(SN)
71. Conditional survival curve in CF scenario
tempvar SC_
72. qui gen `SC_' = 1 - (1 - SC)/(1 - SPc)
73. qui sum `SC_'
74. Mean age started among those starting by age $xMax in CF scenario
global XC - $XMin + i(mean)*SN
75. di %7.0f ST1, %7.0f ST2,%7.0f ST3, %7.1f Srl, %7.1f Sr2, %7.1f SR3, %7.3
%8.3C CPH, %7.2f CXB - SXC
%6 end
```

prog	del	tanjesc	di	T1	T2	T3	r1	r2	r3	deltap	deltax
1.	getSC	1954	1963	2001	1.0	1.0	1.0				
2.	getSC	1954	1963	2001	1.0	0.9	1.0				
4.	getSC	1954	1963	2001	1.0	0.8	1.0				
5.	qui	gen	FC7lo	=	1	-	SC				
6.	lab	var	FC7lo	-FC	(no	post=2000	Misconduct)	low	est."		
7.	getSC	1954	1963	2001	1.0	0.8	0.8				
8.	qui	gen	FC7lo	=	1	-	SC				
9.	lab	var	FC7lo	-FC	(post=2000	Misconduct)	low	est."			
10.	getSC	1954	1963	2001	1.0	0.7	1.0				
11.	getSC	1954	1963	2001	1.0	0.6	1.0				
12.	getSC	1954	1963	2001	0.9	0.9	1.0				
13.	getSC	1954	1963	2001	0.9	0.8	1.0				

```

14. ....Wecker Change: replace 0.7 with 1.0.....
.
.
. *getSC 1954 1963 2001 0.9 0.7 1.0
.
. *getSC 1954 1963 2001 0.9 1.0 1.0
15. ....*****End Wecker Change*****

```

```

16. lab var FC_low*FC (no post-2000 Misconduct) mid est.*
17. getSC 1954 1963 2001 0.9 0.7 0.7
18. qui gen FC7 = 1 - SC
19. lab var FC7 -FC (post-2000 Misconduct) mid est.*
20. getSC 1954 1963 2001 0.9 0.6 1.0
21. getSC 1954 1963 2001 0.8 0.8 1.0
22. getSC 1954 1963 2001 0.8 0.7 1.0
23. getSC 1954 1963 2001 0.8 0.6 1.0
24. qui gen FC_hi = 1 - SC
25. lab var FC_hi -FC (no post-2000 Misconduct) high est.*
26. getSC 1954 1963 2001 0.8 0.6 0.6

```

```

27. qui gen FC7hi = 1 - SC
28. lab var FC7hi "FC (post-2000 Misconduct) high est."

* Graph results for T1,T2 = 1954,1963 r1,r2 = 0.9,0.6 vs. T2 = 1988, r2 = 0.6
gr FC_ FB x.ylab(0.25,.5,.75,1)*xlab(10,20,30,40,50)s(ii)rc(JJJ)l1("Cumula
tive Proportion Who Have Begun to Smoke")saving(nir5a,replace)
(Note: file nir5a.gph not found)

gr FC_ FC7 FB x.ylab(0.25,.5,.75,1)*xlab(10,20,30,40,50)s(ii)rc(JJJ)l1("Cumula
tive Proportion Who Have Begun to Smoke")saving(nir5b,replace)
(Note: file nir5b.gph not found)

. keep x r*
. form x %6.0f
. form f* %7.3f

. save nir5_r2, replace
(Note: file nir5_r2.dta not found)
file nir5_r2.dta saved

```

" List data		" i.mod						
	x	FC_lo	FC710	FC_	FC7	FC_hi	FC7hi	FB
1.	9	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.	10	0.022	0.022	0.021	0.021	0.019	0.019	0.022
3.	11	0.029	0.029	0.029	0.027	0.026	0.026	0.030
4.	12	0.040	0.040	0.040	0.038	0.036	0.036	0.041
5.	13	0.055	0.055	0.055	0.052	0.049	0.049	0.057
6.	14	0.080	0.080	0.080	0.075	0.070	0.070	0.083
7.	15	0.122	0.122	0.124	0.115	0.107	0.107	0.128
8.	16	0.186	0.186	0.190	0.174	0.162	0.162	0.196
9.	17	0.245	0.245	0.252	0.230	0.214	0.214	0.260
10.	18	0.326	0.326	0.337	0.305	0.284	0.284	0.347
11.	19	0.384	0.384	0.399	0.360	0.335	0.335	0.409
12.	20	0.454	0.454	0.474	0.427	0.397	0.397	0.485
13.	21	0.501	0.501	0.523	0.471	0.439	0.439	0.534
14.	22	0.529	0.529	0.554	0.518	0.485	0.485	0.565
15.	23	0.549	0.549	0.575	0.538	0.506	0.506	0.586

nir5.log

16.	24	0.568	0.568	0.595	0.535	0.499	0.499	0.605
17.	25	0.585	0.585	0.614	0.552	0.515	0.515	0.624
18.	26	0.600	0.600	0.630	0.566	0.529	0.529	0.640
19.	27	0.614	0.614	0.644	0.579	0.541	0.541	0.654
20.	28	0.622	0.622	0.654	0.589	0.551	0.551	0.668
21.	29	0.629	0.629	0.661	0.594	0.554	0.554	0.671
22.	30	0.641	0.641	0.674	0.600	0.566	0.566	0.684
23.	31	0.648	0.648	0.681	0.613	0.573	0.573	0.691
24.	32	0.655	0.655	0.689	0.619	0.579	0.579	0.698
25.	33	0.662	0.662	0.696	0.626	0.585	0.585	0.705
26.	34	0.669	0.669	0.704	0.633	0.593	0.593	0.713
27.	35	0.675	0.675	0.711	0.639	0.598	0.598	0.720
28.	36	0.679	0.679	0.715	0.643	0.602	0.602	0.724
29.	37	0.682	0.682	0.718	0.645	0.604	0.604	0.727
30.	38	0.685	0.685	0.722	0.649	0.608	0.608	0.730
31.	39	0.687	0.687	0.724	0.651	0.609	0.609	0.732
32.	40	0.695	0.695	0.732	0.658	0.616	0.616	0.740
33.	41	0.697	0.697	0.735	0.660	0.619	0.619	0.743
34.	42	0.699	0.699	0.736	0.662	0.620	0.620	0.744
35.	43	0.700	0.700	0.737	0.663	0.621	0.621	0.746
36.	44	0.701	0.701	0.739	0.664	0.622	0.622	0.747
37.	45	0.704	0.704	0.742	0.667	0.625	0.625	0.750
38.	46	0.706	0.706	0.744	0.669	0.627	0.627	0.752
39.	47	0.708	0.707	0.746	0.670	0.629	0.629	0.754
40.	48	0.708	0.707	0.746	0.670	0.629	0.629	0.754
41.	49	0.709	0.709	0.747	0.672	0.630	0.630	0.755
42.	50	0.711	0.711	0.749	0.674	0.633	0.633	0.757

\* Compute changes in proportion who ever smoked  
global N = 11

\* Baseline scenario:  
di \*9.3f FB(SN)  
0.757

blog def Results      Decrease in proportion smoked      ---  
1. di ----      Low      Middle      High  
2. di \*Post-2000      Est.      Est.      Est.  
3. di \*Misconduct      Est.      Est.      Est.  
4. di \*Yes      \*12.3f FB(SN) - FC7(SN), 12.3f FB(SN) - FC7(SN), 12.3f FB(SN)  
5. di \*FC7(SN)  
6. di \*No      \*12.3f FB(SN) - FC10(SN), 12.3f FB(SN) - FC10(SN), 12.3f FB(SN)  
7. di \*FC10(SN)  
8. end

Results      Decrease in proportion smoked      ---  
----      Low      Middle      High  
Post-2000      Est.      Est.      Est.  
Misconduct      0.046      0.083      0.126  
Yes      0.046      0.008      0.124  
No

. log close

52614 0836

7

```

* @R0500
* nlr6: BL-CF differences in proportion of ever-smokers and
* mean smoke-years exposure of claimants in HRA audit files
* Relative risk initiation model hC(t) = 1 + (T1 - T2) * (1 - exp(-lambda * (T1 - T2)))
* hC(t) = r2 * hB(t) if year >= T2, where T2 = max(T1, Ylexp)
* hC(t) = r3 * hB(t) if year >= T3, where T3 = max(T1, Ylexp)
* (R3 can be any value, not just 1; T3 can be any value, not just Ylexp)
* T2 = max(T1, Ylexp), T3 = max(T1, Ylexp)
* Relative reduction r2 in
* initiation rate begins only after start of employment/exposure to asbestos
* Crossover insulators excluded
* Scenario pre-kg misconduct
* BL 1.0
* CF yes low 1.0 0.8 1.0
* CF yes mid 0.9 0.7 1.0
* CF yes high 0.8 0.6 1.0
* Input files: (nir) concatenated HRA audit samples (from nir)
* clear
* prproj drop _all
* set rmsg off
* set more off
* set matsize 200
* log using nlr6, replace
* use nir, clear
* (1) Save distribution of yrborn in Matrix pi(t)
* Exclude observations for which yrbegin was imputed in nlr1.do
* Exclude observations for which date of first exposure to asbestos unknown
* drop if !begin == 0
* drop if Ylexp == .
* qui tab yrborn (w=w), matcell(pi) matrow(t_)
* matrix pi = pi/_result(1)
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
* matrix colnames pi = t pi(t)
* global m = rowsof(pi)
* matrix drop t_
* Distribution of year of birth
* matrix list pi
* Tabulate year first exposed to asbestos
* tab Ylexp (w=w), missing
* qui gen byte smk_exp = yrbegin < Ylexp
* lab var smk_exp "Began smoking before 1st employment with asbestos"
* tab smk_exp (w=w)
* (2) Set up duration variable for initiation analysis
* gen int ageEnd = ageBegin
* replace ageEnd = yrried - yrborn if ageEnd == .
* replace ageEnd = yrsett - yrborn if ageEnd == .
* replace ageEnd = yrrecv - yrborn if ageEnd == .
* gen byte smoked = Smoker == 1
* (3) Compute initiation survival curve
* sts ageEnd (w=w), failure(Smoker) origin(time 0) scale(1) id(poc)
* sts generate SB = s
* form SB $9.3f
* gen byte x = _t
* lab var x "Age"

```

**2**

# HUMPHREY

```

* Check Tj > T2 > T1
if ST2 <= ST1 | ST3 <= ST2 {
di "Invalid ", #9.0f $T1,$T2,$T3
exit
}

* Compute SB(x)'r1 SB(x)'r2 SB(x)'r3
qui replace SBr1 = SB'Sr1
qui replace SBr2 = SB'Sr2
qui replace SBr3 = SB'Sr3
qui replace SC = 0
* Compute SC = SUM(t) pi(t)*SB(x)'r2*SB(min(x,T1-t))^(1-r1)*SB(min(x,T2-t))^(r1-r2)*SB(min(x,T3-t))^(r2-r3) for all x
in(x,T1-t)(T2-r3) for all x
local i = 1
Sum over index 'i' (rows of pi)
while 'i' <= Cm {
local t = pi('i',1)
local p = pi('i',2)
'x1' = age at T1
local x1 = $T1 - 't'
'x2' = age at T2
local x2 = min($T2 - 't',$Sxmax)
'x3' = age at T3
local x3 = min($T3 - 't',$Sxmax)
local x2 = max($T2,$lexp) (later of $T2 and year 1st exposed)
local x3 = max($T3,$lexp) - 't'
local x2 = min('x2', $Sxmax)
local x3 = min('x3', $Sxmax)
'xj' = age at Tj
local xj = min($Tj - 't',$Sxmax)
local x2 = max($T2,$lexp) - 't'
local x3 = min('x3', $Sxmax)
Note: xj >= x2 >= x1
'v1' = obs# at age at T1
local u1 = 'x1' - $Xmin
local v1 = 'x1' - $Xmin + 1
'v2' = obs# at age at T2
local u2 = 'x2' - $Xmin
local v2 = 'x2' - $Xmin + 1
'v3' = obs# at age at T3
local u3 = 'x3' - $Xmin
local v3 = 'x3' - $Xmin + 1
Note: u3 >= u2 >= u1
local A1 = SB['u1']*(1-$r1)
local A2 = SB['u2']*(1-$r1+$r2)
local A3 = SB['u3']*(1-$r1+$r2+$r3)
DEBUGGING
di '#1', 't', 'x1', 'x2', 'x3', 'v1', 'v2', 'v3'
'v1', 'v2', 'v3' = 'v1', 'v2', 'v3'
Null Case:
if 'x1' >= $Sxmax {
DEBUGGING
di "Null case"
qui replace SC = SC + 'p' * SB
}
else {
if 'u3' <= 0 {
Case A: 'u1' <= 0 & 'u2' <= 0 & 'u3' <= 0
DEBUGGING
di "Case A"
qui replace SC = SC + 'p' * SBr3
}
else {
if 'u3' > 0 & 'u2' <= 0 {
Case B:
di "Case B"
}
}
}
}
}

* DEBUGGING
qui replace SC = SC + 'p' * SBr2 in 1/'u3'
if 'v1' <= SN {
qui replace SC = SC + 'p' * SBr1 in 1/'u1'
} else {
qui replace SC = SC + 'p' * SBr3 in 1/'u3'
}
}

* Case C:
di "Case C"
qui replace SC = SC + 'p' * SBr1 in 1/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC = SC + 'p' * SBr2 * 'A1' * 'A2' in 'v2'/'u3'
}
if 'v3' <= SN {
qui replace SC = SC + 'p' * SBr3 * 'A1' * 'A2' * 'A3' in 'v3'/'u3'
}
}

* Case D:
di "Case D"
qui replace SC = SC + 'p' * SB in 1/'u1'
qui replace SC = SC + 'p' * SBr1 * 'A1' in 'v1'/'u2'
if 'v2' <= 'u3' {
qui replace SC
```

nir6\_r2.do

\*\*\*\*\*Wecker Change: replace 0.7 with 1.0\*\*\*\*\*

```
*getSC 1954 1963 2001 0.9 0.7 1.0
*getSC 1954 1963 2001 0.9 1.0 1.0
```

\*\*\*\*\*End Wecker Change\*\*\*\*\*

```
qui gen FC_ = 1 - SC
lab var FC_ FC (no post-2000 Misconduct) mid est.
getSC 1954 1963 2001 0.9 0.7 0.7
qui gen FC7 = 1 - SC
lab var FC7 FC (post-2000 Misconduct) mid est.
getSC 1954 1963 2001 0.9 0.6 1.0
getSC 1954 1963 2001 0.8 0.8 1.0
getSC 1954 1963 2001 0.8 0.7 1.0
getSC 1954 1963 2001 0.8 0.6 1.0
qui gen FC_hi = 1 - SC
lab var FC_hi FC (no post-2000 Misconduct) high est.
getSC 1954 1963 2001 0.8 0.6 0.6
qui gen FC7hi = 1 - SC
lab var FC7hi FC (post-2000 Misconduct) high est.
```

end

\*\*\*\*\*

```
qui gen FB = 1 - SB
* Graph results for T1,T2 = 1954,1963 r1,r2 = 0.9,0.6 vs. T2 = 1988, r2 = 0.6
ui FC_ FB x,ylab(0.25,.5,.75,1)xiab(10,20,30,40,50)s(1111)c(JJJJ)l1("Cumulative Proportion Who Have Begun to Smoke")saving(nir6a.replace)
ui FC_ FC7 FB x,ylab(0.25,.5,.75,1)xiab(10,20,30,40,50)s(1111)c(JJJJ)l1("Cumulative Proportion Who Have Begun to Smoke")saving(nir6b.replace)
keep x F*
form x %6.0f
form F* %7.3f
save nir6_r2, replace
* List data
l,mod
```

\* Compute Changes in proportion who ever smoked

```
global N = _N
* Baseline scenario:
di %9.3f FB(SN)
prog def Results
di "----"
di "Decrease in proportion smoked"
di "Post-2000" Low Middle High
di "Misconduct" Est. Est. Est.
di "Yes" ,.12.3f FB(SN) - FC7(SN),.12.3f FB(SN) - FC7(SN),.12.3f FB(SN) - FC7hi(SN)
di "No" ,.12.3f FB(SN) - FC_lo(SN),.12.3f FB(SN) - FC_lo(SN),.12.3f FB(SN) - FC_hi(SN)
end
Results
log close
\032
```

Produced by RJRTC  
in  
HUMPHREY

use nix, clear

```
(1) Save distribution of yrborn in matrix pi
(2) Exclude observations for which yrborn is input
(3) drop if iBegin == 0
(4) observations deleted
(5) Exclude observations for which date of first exposure to asbestos unknown
(6) drop if Yieexp == .
(7) observations deleted
(8) qui tab yrborn (w=w), matcell(pi) matrow(w)
(9) matrix pi = pi/_result(1)
(10) matrix pi = pi/_pi
(11) m = number of rows of pi
(12) col 1 (year t), col 2 (pi(t))
(13) matrix colnames pi = t pi(t)
```

global w = rowsof(pi)

matrix drop t

Distribution of year of birth

matrix list pi

t	pi(t)
1896	.00018528
1897	.00014319
1898	.00014319
1899	.00014319
1900	.00014319
1901	.00014319
1902	.00014319
1903	.00014319
1904	.00014319
1905	.00014319
1906	.00014319
1907	.00014319
1908	.00014319
1909	.00014319
1910	.00014319
1911	.00014319
1912	.00014319
1913	.00014319
1914	.00014319
1915	.00014319
1916	.00014319
1917	.00014319
1918	.00014319
1919	.00014319
1920	.00014319
1921	.00014319
1922	.00014319
1923	.00014319
1924	.00014319
1925	.00014319
1926	.00014319
1927	.00014319
1928	.00014319
1929	.00014319
1930	.00014319
1931	.00014319
1932	.00014319
1933	.00014319
1934	.00014319
1935	.00014319
1936	.00014319
1937	.00014319
1938	.00014319
1939	.00014319
1940	.00014319
1941	.00014319
1942	.00014319
1943	.00014319
1944	.00014319
1945	.00014319
1946	.00014319
1947	.00014319
1948	.00014319
1949	.00014319
1950	.00014319
1951	.00014319
1952	.00014319
1953	.00014319
1954	.00014319
1955	.00014319
1956	.00014319
1957	.00014319
1958	.00014319
1959	.00014319
1960	.00014319
1961	.00014319
1962	.00014319
1963	.00014319
1964	.00014319
1965	.00014319
1966	.00014319
1967	.00014319
1968	.00014319
1969	.00014319
1970	.00014319
1971	.00014319
1972	.00014319
1973	.00014319
1974	.00014319
1975	.00014319
1976	.00014319
1977	.00014319
1978	.00014319
1979	.00014319
1980	.00014319
1981	.00014319
1982	.00014319
1983	.00014319
1984	.00014319
1985	.00014319
1986	.00014319
1987	.00014319
1988	.00014319
1989	.00014319
1990	.00014319
1991	.00014319
1992	.00014319
1993	.00014319
1994	.00014319
1995	.00014319
1996	.00014319
1997	.00014319
1998	.00014319
1999	.00014319
2000	.00014319

Tabulate year first exposed to asbestos  
tab Yieexp (w=w), missing  
(frequency weights assumed)

Year 1st Exposed to Asbestos	Freq.	Percent	Cum.
1912	986	0.00	0.00
1916	290	0.00	0.00
1920	40840	0.14	0.14
1921	3110	0.01	0.15
1922	19809	0.07	0.22
1923	56285	0.19	0.41
1924	8718	0.03	0.44
1925	36357	0.12	0.56
1926	23378	0.08	0.64
1927	19837	0.07	0.70
1928	42169	0.14	0.84
1929	39256	0.13	0.98
1930	34287	0.12	1.09
1931	57118	0.19	1.28
1932	34116	0.11	1.40
1933	101397	0.34	1.74
1934	109712	0.37	2.11
1935	198040	0.66	2.77
1936	271812	0.91	3.68
1937	323316	1.09	4.77
1938	264281	0.89	5.66
1939	421068	1.41	7.07
1940	999414	3.35	10.42
1941	1236684	4.15	14.57



nir6.log

```
. replace x = $xMin in $N
(1 real change made)

. replace FB = 0. in $N
(1 real change made)

. replace SB = 1. in $N
(1 real change made)
```

```
. sort x
```

```
. form FB #9.0y
```

```
. gr FB x if x=50. xlab(10,15,20,25,30,35,40,45,50)ylab(0,.25,.5,.75,1)si)c(J
```

```
> )saving(nir3a.replace)
```

```
. form FB #9.3t
```

```
. 1 x FB if x=50
```

X	FB
1.	9
2.	10
3.	11
4.	12
5.	13
6.	14
7.	15
8.	16
9.	17
10.	18
11.	19
12.	20
13.	21
14.	22
15.	23
16.	24
17.	25
18.	26
19.	27
20.	28
21.	29
22.	30
23.	31
24.	32
25.	33
26.	34
27.	35
28.	36
29.	37
30.	38
31.	39
32.	40
33.	41
34.	42
35.	43
36.	44
37.	45
38.	46
39.	47
40.	48
41.	49
42.	50

```
* (4) Computation of initiation rates in CF scenario
* Cutoff years for decrease in initiation rates are $T1 and max($T2,$Yexp)
* Relative decrease in initiation rate (on or after year T1) is global variab
le $r1
* Relative decrease in initiation rate (on or after max($T2,$Yexp)) is global
variable $r2
* Relative decrease in initiation rate (on or after max($T3,$Yexp)) is global
variable $r3
```

```
* SB(x) cumulative proportion not smoking through age x in BL scenario.
. keep SB x Yexp
```

```
. sort x
```

```
. order x SB
```

```
* Global maximum for ever smoking
. global $xMax
```

```
. drop if x > $xMax
(44 observations deleted)
```

```
. qui sum x
```

```
. global xMin = r(min)
```

```
. global N = _N
```

```
* Lifetime probability of not smoking by age $xMax in BL scenario
```

```
. global PB = SB($N)
```

```
* Conditional survival curve in BL scenario
```

```
. qui gen SB_ = 1 - (1 - SB)/(1 - $PB)
```

```
. qui sum SB_
```

```
* Mean age started among those starting by age $xMax in BL scenario
```

```
. global XB = $xMin + r(mean)*$N
```

```
. di "Probability of not smoking (by age $xMax) = ",XB/$PB
```

```
Probability of not smoking (by age 50) = 0.243
```

```
. di "Mean age started (among those starting by age $xMax) = ",XB.$PB
Mean age started (among those starting by age 50) = 20.7
```

```
. drop SB_
```

```
* SBr3 = SB(x)^r3; SBr2 = SB(x)^r2; SBr1 = SB(x)^r1
```

```
. qui gen SBr1 = .
```

```
. qui gen SBr2 = .
```

```
. qui gen SBr3 = .
```

```
. gen SC = .
```

```
(42 missing values generated)
```

```
. prog def getSC
```

```
1. * $_1 = T1; $_2 = T2; $_3 = T3; $_4 = r1; $_5 = r2; $_6 = r3
```

52614 0842

13



produced

<http://legacy.library.ucsf.edu/external/07a00/pdf> [www.industrydocuments.ucsf.edu/docs/ffgl0001](http://www.industrydocuments.ucsf.edu/docs/ffgl0001)



nir6.log

```
2. di Post-2000 Low Middle High
3. di Misconduct Est. Est. Est.
4. di Yes - FC7lo(SN), A12.3f FB(SN) - FC7(SN), A12.3f FB(
> SN) - FC7hi(SN) [SN] - FC7(SN), A12.3f FB(SN) - FC7(SN), A12.3f FB(SN)
5. di No - FC7lo(SN), A12.3f FB(SN) - FC7(SN), A12.3f FB(SN) - FC7(SN), A12.3f FB(SN)
6. end
```

```
Results
----
Decrease in proportion smoked
Post 2000 Low Middle High
Misconduct Est. Est. Est. Est.
Yes 0.10 0 0.036 0.057
No 0.008 0 0.056
```

log close

Produced by RJRTC  
in  
HUMPHREY

```

* OM500
* nqr7: BL-CF differences in mean smoke-years exposure
* based upon empirical smoke-survival curve and mortality
* of claimants in HRA audit files (excluding insulator crossovers)
* Relative risk quitting model hc(t) = r*hb(t) if r > 0
* hc(t) = R2*hb(t) if T3 > year >= T2, where T2 = T1
* hc(t) = R3*hb(t) if year >= T3, where T3 > T2
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)
* Projection to future claimants based upon birth-year distribution pi()
* derived from age9.dta and distribution of ever-smokers by birth cohort
* from nir.dta

* (1a) get distribution of birth year of all future claimants from age9.dta
use age9
keep year AllFutur
mkmat year AllFutur
matrix pi = year.AllFutur
* m = number of rows of pi
* col 1 (year t1), col 2 (pi(t1))
matrix colnames pi = t pi(t)
global m = rowsc(pi)
matrix list pi
drop _all

* (1b) Compute ever-smoking prevalence by birth cohort from nir.dta
* Note: 'nir.dta' excludes insulator crossovers
drop _all
keep nir
use nir
keep coh Smok w
tab coh (w=w), sum(Smok)

* Matrix E holds ever-smoking prevalence by cohort
matrix E = (1980, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971)
matrix E = E. J(5,1,0)
matrix colnames E = t0 t1 Ever

prog def setE
local i = 1
while 'i' <= 5
    qui sum Smok [w=w] if coh == 'i'
    matrix E['i',3] = r(mean)
    local i = 'i' + 1
end

setE
matrix li E

* (1c) Compute conditional distribn of birth year pi() among ever smokers

drop _all
svmat pi
matrix li t
matrix pi = pi
matrix colnames pi = t pi(t)
matrix list pi
drop _all

* Replace pi_ in 2nd col of matrix pi()
mkmat pi_
matrix pi = pi[1..5m,1..1]
matrix pi = pi.pi_

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked

drop _all
* Get L and SB from nqr4 output
use nqr4
qui sum x
global xmin = r(min)
global N = _N

* LSB is proportion who are still smoking and alive
gen LSB = L*SB
qui sum LSB
* EB is mean smoke-years taking mortality into account
global EB = r(mean)*$N
di "Mean smoke-years (BL) = ", $9.2f $EB
* LSBR3 = L(x)*SB(x)^R3; LSBR2 = L(x)*SB(x)^R2; LSBR1 = L(x)*SB(x)^R1
gen LSBR1 = .
gen LSBR2 = .
gen LSBR3 = .
gen SC = .

prog def LSC
* $_1 = T1; $_2 = T2; $_3 = T3; $_4 = R1; $_5 = R2; $_6 = R3
global T1 = $_1
global T2 = $_2
global T3 = $_3
global R1 = $_4
global R2 = $_5
global R3 = $_6
global T3 > T2 > T1
if ST2 <= ST1 | ST3 <= ST2 (
    di "Invalid ", $9.0f ST1,ST2,ST3
    exit
)
* Compute SB(x)^R1 and L(x)*SB(x)^R1
* Compute SB(x)^R2 and L(x)*SB(x)^R2
* Compute SB(x)^R3 and L(x)*SB(x)^R3

```

```

qui replace L$BR1 = L$B-SR1
qui replace L$BR2 = L$B-SR2
qui replace L$BR3 = L$B-SR3
qui replace SC = 0
Compute SC = SUM((t) pi(t) * L(x) * SB(x))
SB(min(x, T2-C)) / (R1-R2) * SB(min(x, T3-C)) / (R2-R3)
Sum over index 'i' (rows of pi)
local i = 1
while 'i' <= 5m {
  local t = pi('i', 1)
  't' Year of birth
  local u1 = T1 - 't' - $XMin - 1
  local v1 = 'u1' + 1
  local u2 = T2 - 't' - $XMin - 1
  local v2 = 'u2' + 1
  local u3 = min(T3 - 't' - $XMin - 1, $N)
  local v3 = 'u3' + 1
  Compute intermediate 'areas'
  local A1 = SB('u1') / (1-SR1)
  local A2 = SB('u2') / (SR1-SR2)
  local A3 = SB('u3') / (SR2-SR3)
  'u3' > 'u2' > 'u1' required
  Case A:
    if 'u3' <= 0 {
      qui replace SC = SC + pi('i', 2) * L$BR1
    }
  else {
    Case B:
      if 'u3' > 0 & 'u2' > 0 {
        qui replace SC = SC + pi('i', 2) * L$BR2 in 'u3'
      }
      if 'v3' <= $N {
        qui replace SC = SC + pi('i', 2) * L$BR3 + 'A3' in 'v3'/$N
      }
    }
  }
  Case C:
    if 'u2' < 0 & 'u1' > 0 {
      qui replace SC = SC + pi('i', 2) * L$BR1 in 'u2'
    }
    qui replace SC = SC + pi('i', 2) * L$BR2 + 'A2' in 'v2'/'u3'
    if 'v3' <= $N {
      qui replace SC = SC + pi('i', 2) * L$BR3 + 'A3' in 'v3'/$N
    }
  }
  Case D:
    qui replace SC = SC + pi('i', 2) * L$B in 'u1'
    qui replace SC = SC + pi('i', 2) * L$BR1 + 'A1' in 'v1'/'u2'
    qui replace SC = SC + pi('i', 2) * L$BR2 + 'A1' + 'A2' in 'v2'/'u3'
    if 'v3' <= $N {
      qui replace SC = SC + pi('i', 2) * L$BR3 + 'A1' + 'A2' + 'A3' in 'v3'/$N
    }
  }
}

log close
\032

```

```

end
rangeSC
gr SC SC_B$1 x if x<=75, ylab(0..25, .5, .75, 1) xlab(20, 30, 40, 50, 60, 70) s(11)c(JJ) l1("Proportion
Still Alive and Smoking") saving(nqr7a, replace)
gr SC SC3 LSB x if x<=75, ylab(0..25, .5, .75, 1) xlab(20, 30, 40, 50, 60, 70) s(11)c(JJ) l1("Prop
ortion Still Alive and Smoking") saving(nqr7b, replace)
form LSB SC* $7.3f
form x %6.0f
keep x LSB SC_
l, nod
save nqr7_R2_R1, replace

```

```

log close
\032

```

<http://legacy.library.ucsf.edu/stid/sg07a00/pdf> [www.industrydocuments.ucsf.edu/docs/ffgl0001](http://www.industrydocuments.ucsf.edu/docs/ffgl0001)

matrix E = (1880, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971 )

matrix E = E, J(5,1,0)

matrix colnames E = t0 t1 Ever

prog def setE

```
1. local i = 1
2. while 'i' <= 5 {
3.   qui sum Smok (w=w) if coh == 'i'
4.   matrix E('i',3) = r(mean)
5.   local i = 'i' + 1
6. }
7. end
```

setE

matrix li E

E(5,3)

	t0	t1	Ever
r1	1880	1909	65828276
r2	1910	1919	78556302
r3	1920	1929	79828907
r4	1930	1939	75219631
r5	1940	1971	75717905

(1c) Compute conditional distribn of birth year pi() among ever smokers

drop \_all

smat pi

number of observations will be reset to 72

Press any key to continue, or Break to abort

obs was 0, now 72

ren pi1 t

ren pi2 pi

qui gen pi\_ =

form pi\_ \$9.4f

prog def getpi

```
1. local i = 1
2. while 'i' <= 5 {
3.   replace pi_ = E('i',1) & t == E('i',2)
4.   Note: birth cohort will be reduced by 3.6% (nir4.log).
5.   But this feedback effect is very small.
6.   local i = 'i' + 1
7. }
8. qui replace pi_ = (mean) sum pi_
9. end
```

getpi

(10 real changes made)

(10 real changes made)

(10 real changes made)

(10 real changes made)

(10 real changes made)

(10 real changes made)

(10 real changes made)

(10 real changes made)

(10 real changes made)

(10 real changes made)  
(32 real changes made)

produced by RRTC

matrix pi = pi(1..Sm,1..1)

matrix pi = pi.pi

IN

(2) Compute Mean Years Smoked Among Persons Who Ever Smoked

drop \_all

HUMPHREY

global xmin = r(min)

global N = \_N

LSB is proportion who are still smoking and alive

gen LSB = L\*SB

qui sum LSB

EB is mean smoke-years taking mortality into account

global EB = r(mean)\*SN

di Mean smoke-years (BL) = ,89.2f SEB

Mean smoke-years (BL) = 45.43

LSBR3 = L(x)\*SB(x)\*R3; LSBR2 = L(x)\*SB(x)\*R2; LSBR1 = L(x)\*SB(x)\*R1

gen LSBR1 =

(82 missing values generated)

gen LSBR2 =

(82 missing values generated)

gen LSBR3 =

(82 missing values generated)

gen SC =

(82 missing values generated)

prog def LSC

1. \$ \_T1: T1; \$ \_2 = T2; \$ \_3 = T3; \$ \_4 = R1; \$ \_5 = R2; \$ \_6 = R3

global T1 = \$ \_1

2. global T2 = \$ \_2

3. global T3 = \$ \_3

4. global R1 = \$ \_4

5. global R2 = \$ \_5

6. global R3 = \$ \_6

7. Check T3 > T2 > T1

if \$T2 <= \$T1 | \$T3 <= \$T2 {

di Invalid .49.0f \$T1.\$T2.\$T3

9. exit

10. }

```

11. Compute SB(x)R1 and L(x)*SB(x)R1
12. Compute SB(x)R2 and L(x)*SB(x)R2
13. Compute SB(x)R3 and L(x)*SB(x)R3
14. qui replace LSBR1 = L*SB*SR1
15. qui replace LSBR2 = L*SB*SR2
16. qui replace LSBR3 = L*SB*SR3
17. qui replace SC = 0
18. qui replace SC = SUM(t) pi(t)*L(x)*SB(x)*R1*(1-R1)*
    SB(min(x,T2-t))*R1-R2)*SB(min(x,T3-t))*R2-R3 for all x
19. sum over index i (rows of pi)
20. local i = 1
21. while i <= $m
22. local t = pi(i,1)
23. local u1 = $T1 - t - $xMin - 1
24. local u2 = $T2 - t - $xMin - 1
25. local u3 = $T3 - t - $xMin - 1
26. local v1 = 'u1'
27. local v2 = 'u2'
28. local v3 = 'u3'
29. Compute intermediate areas
30. local A1 = SB(u1) - (1-SR1)
31. local A2 = SB(u2) - (SR1-SR2)
32. local A3 = SB(u3) - (SR2-SR3)
33. 'u1', 'u2', 'u3' required
34. (Case A:
35. if 'u3' = 0
36. qui replace SC = SC + pi(i,2) * LSBR2 in 'u3'
37. else
38. Case B:
39. if 'u3' > 0 & 'u2' <= 0
40. qui replace SC = SC + pi(i,2) * LSBR2 in 'u3'
41. if 'v3' <= $N
42. qui replace SC = SC + pi(i,2) * LSBR3 * 'A3' in 'v3'/$N
43. else
44. Case C:
45. if 'u2' < 0 & 'u1' > 0 => 0
46. qui replace SC = SC + pi(i,2) * LSBR1 in 'u2'
47. qui replace SC = SC + pi(i,2) * LSBR2 * 'A2' in 'v2'/'u3'
48. if 'v1' <= $N
49. qui replace SC = SC + pi(i,2) * LSBR3 * 'A3' in 'v3'/'
50. 'v1'
51. 'v2'
52. 'v3'
53. 'v1'
54. 'v2'
55. 'v3'
56. local i = i + 1
57. qui sum SC
58. Global EC = (mean) $N
59. ip $7.00 $2.00 $3.00 $4.00 $5.00 $6.00 $7.00 $8.00 $9.00 $10.00 $11.00 $12.00 $13.00 $14.00 $15.00 $16.00 $17.00 $18.00 $19.00 $20.00 $21.00 $22.00 $23.00 $24.00 $25.00 $26.00 $27.00 $28.00 $29.00 $30.00 $31.00 $32.00 $33.00 $34.00 $35.00 $36.00 $37.00 $38.00 $39.00 $40.00 $41.00 $42.00 $43.00 $44.00 $45.00 $46.00 $47.00 $48.00 $49.00 $50.00 $51.00 $52.00 $53.00 $54.00 $55.00 $56.00 $57.00 $58.00 $59.00 $60.00 $61.00 $62.00 $63.00 $64.00 $65.00 $66.00 $67.00 $68.00 $69.00 $70.00 $71.00 $72.00 $73.00 $74.00 $75.00 $76.00 $77.00 $78.00 $79.00 $80.00 $81.00 $82.00 $83.00 $84.00 $85.00 $86.00 $87.00 $88.00 $89.00 $90.00 $91.00 $92.00 $93.00 $94.00 $95.00 $96.00 $97.00 $98.00 $99.00 $100.00 $101.00 $102.00 $103.00 $104.00 $105.00 $106.00 $107.00 $108.00 $109.00 $110.00 $111.00 $112.00 $113.00 $114.00 $115.00 $116.00 $117.00 $118.00 $119.00 $120.00 $121.00 $122.00 $123.00 $124.00 $125.00 $126.00 $127.00 $128.00 $129.00 $130.00 $131.00 $132.00 $133.00 $134.00 $135.00 $136.00 $137.00 $138.00 $139.00 $140.00 $141.00 $142.00 $143.00 $144.00 $145.00 $146.00 $147.00 $148.00 $149.00 $150.00 $151.00 $152.00 $153.00 $154.00 $155.00 $156.00 $157.00 $158.00 $159.00 $160.00 $161.00 $162.00 $163.00 $164.00 $165.00 $166.00 $167.00 $168.00 $169.00 $170.00 $171.00 $172.00 $173.00 $174.00 $175.00 $176.00 $177.00 $178.00 $179.00 $180.00 $181.00 $182.00 $183.00 $184.00 $185.00 $186.00 $187.00 $188.00 $189.00 $190.00 $191.00 $192.00 $193.00 $194.00 $195.00 $196.00 $197.00 $198.00 $199.00 $200.00 $201.00 $202.00 $203.00 $204.00 $205.00 $206.00 $207.00 $208.00 $209.00 $210.00 $211.00 $212.00 $213.00 $214.00 $215.00 $216.00 $217.00 $218.00 $219.00 $220.00 $221.00 $222.00 $223.00 $224.00 $225.00 $226.00 $227.00 $228.00 $229.00 $230.00 $231.00 $232.00 $233.00 $234.00 $235.00 $236.00 $237.00 $238.00 $239.00 $240.00 $241.00 $242.00 $243.00 $244.00 $245.00 $246.00 $247.00 $248.00 $249.00 $250.00 $251.00 $252.00 $253.00 $254.00 $255.00 $256.00 $257.00 $258.00 $259.00 $260.00 $261.00 $262.00 $263.00 $264.00 $265.00 $266.00 $267.00 $268.00 $269.00 $270.00 $271.00 $272.00 $273.00 $274.00 $275.00 $276.00 $277.00 $278.00 $279.00 $280.00 $281.00 $282.00 $283.00 $284.00 $285.00 $286.00 $287.00 $288.00 $289.00 $290.00 $291.00 $292.00 $293.00 $294.00 $295.00 $296.00 $297.00 $298.00 $299.00 $300.00 $301.00 $302.00 $303.00 $304.00 $305.00 $306.00 $307.00 $308.00 $309.00 $310.00 $311.00 $312.00 $313.00 $314.00 $315.00 $316.00 $317.00 $318.00 $319.00 $320.00 $321.00 $322.00 $323.00 $324.00 $325.00 $326.00 $327.00 $328.00 $329.00 $330.00 $331.00 $332.00 $333.00 $334.00 $335.00 $336.00 $337.00 $338.00 $339.00 $340.00 $341.00 $342.00 $343.00 $344.00 $345.00 $346.00 $347.00 $348.00 $349.00 $350.00 $351.00 $352.00 $353.00 $354.00 $355.00 $356.00 $357.00 $358.00 $359.00 $360.00 $361.00 $362.00 $363.00 $364.00 $365.00 $366.00 $367.00 $368.00 $369.00 $370.00 $371.00 $372.00 $373.00 $374.00 $375.00 $376.00 $377.00 $378.00 $379.00 $380.00 $381.00 $382.00 $383.00 $384.00 $385.00 $386.00 $387.00 $388.00 $389.00 $390.00 $391.00 $392.00 $393.00 $394.00 $395.00 $396.00 $397.00 $398.00 $399.00 $400.00 $401.00 $402.00 $403.00 $404.00 $405.00 $406.00 $407.00 $408.00 $409.00 $410.00 $411.00 $412.00 $413.00 $414.00 $415.00 $416.00 $417.00 $418.00 $419.00 $420.00 $421.00 $422.00 $423.00 $424.00 $425.00 $426.00 $427.00 $428.00 $429.00 $430.00 $431.00 $432.00 $433.00 $434.00 $435.00 $436.00 $437.00 $438.00 $439.00 $440.00 $441.00 $442.00 $443.00 $444.00 $445.00 $446.00 $447.00 $448.00 $449.00 $450.00 $451.00 $452.00 $453.00 $454.00 $455.00 $456.00 $457.00 $458.00 $459.00 $460.00 $461.00 $462.00 $463.00 $464.00 $465.00 $466.00 $467.00 $468.00 $469.00 $470.00 $471.00 $472.00 $473.00 $474.00 $475.00 $476.00 $477.00 $478.00 $479.00 $480.00 $481.00 $482.00 $483.00 $484.00 $485.00 $486.00 $487.00 $488.00 $489.00 $490.00 $491.00 $492.00 $493.00 $494.00 $495.00 $496.00 $497.00 $498.00 $499.00 $500.00 $501.00 $502.00 $503.00 $504.00 $505.00 $506.00 $507.00 $508.00 $509.00 $510.00 $511.00 $512.00 $513.00 $514.00 $515.00 $516.00 $517.00 $518.00 $519.00 $520.00 $521.00 $522.00 $523.00 $524.00 $525.00 $526.00 $527.00 $528.00 $529.00 $530.00 $531.00 $532.00 $533.00 $534.00 $535.00 $536.00 $537.00 $538.00 $539.00 $540.00 $541.00 $542.00 $543.00 $544.00 $545.00 $546.00 $547.00 $548.00 $549.00 $550.00 $551.00 $552.00 $553.00 $554.00 $555.00 $556.00 $557.00 $558.00 $559.00 $560.00 $561.00 $562.00 $563.00 $564.00 $565.00 $566.00 $567.00 $568.00 $569.00 $570.00 $571.00 $572.00 $573.00 $574.00 $575.00 $576.00 $577.00 $578.00 $579.00 $580.00 $581.00 $582.00 $583.00 $584.00 $585.00 $586.00 $587.00 $588.00 $589.00 $590.00 $591.00 $592.00 $593.00 $594.00 $595.00 $596.00 $597.00 $598.00 $599.00 $600.00 $601.00 $602.00 $603.00 $604.00 $605.00 $606.00 $607.00 $608.00 $609.00 $610.00 $611.00 $612.00 $613.00 $614.00 $615.00 $616.00 $617.00 $618.00 $619.00 $620.00 $621.00 $622.00 $623.00 $624.00 $625.00 $626.00 $627.00 $628.00 $629.00 $630.00 $631.00 $632.00 $633.00 $634.00 $635.00 $636.00 $637.00 $638.00 $639.00 $640.00 $641.00 $642.00 $643.00 $644.00 $645.00 $646.00 $647.00 $648.00 $649.00 $650.00 $651.00 $652.00 $653.00 $654.00 $655.00 $656.00 $657.00 $658.00 $659.00 $660.00 $661.00 $662.00 $663.00 $664.00 $665.00 $666.00 $667.00 $668.00 $669.00 $670.00 $671.00 $672.00 $673.00 $674.00 $675.00 $676.00 $677.00 $678.00 $679.00 $680.00 $681.00 $682.00 $683.00 $684.00 $685.00 $686.00 $687.00 $688.00 $689.00 $690.00 $691.00 $692.00 $693.00 $694.00 $695.00 $696.00 $697.00 $698.00 $699.00 $700.00 $701.00 $702.00 $703.00 $704.00 $705.00 $706.00 $707.00 $708.00 $709.00 $710.00 $711.00 $712.00 $713.00 $714.00 $715.00 $716.00 $717.00 $718.00 $719.00 $720.00 $721.00 $722.00 $723.00 $724.00 $725.00 $726.00 $727.00 $728.00 $729.00 $730.00 $731.00 $732.00 $733.00 $734.00 $735.00 $736.00 $737.00 $738.00 $739.00 $740.00 $741.00 $742.00 $743.00 $744.00 $745.00 $746.00 $747.00 $748.00 $749.00 $750.00 $751.00 $752.00 $753.00 $754.00 $755.00 $756.00 $757.00 $758.00 $759.00 $760.00 $761.00 $762.00 $763.00 $764.00 $765.00 $766.00 $767.00 $768.00 $769.00 $770.00 $771.00 $772.00 $773.00 $774.00 $775.00 $776.00 $777.00 $778.00 $779.00 $780.00 $781.00 $782.00 $783.00 $784.00 $785.00 $786.00 $787.00 $788.00 $789.00 $790.00 $791.00 $792.00 $793.00 $794.00 $795.00 $796.00 $797.00 $798.00 $799.00 $800.00 $801.00 $802.00 $803.00 $804.00 $805.00 $806.00 $807.00 $808.00 $809.00 $810.00 $811.00 $812.00 $813.00 $814.00 $815.00 $816.00 $817.00 $818.00 $819.00 $820.00 $821.00 $822.00 $823.00 $824.00 $825.00 $826.00 $827.00 $828.00 $829.00 $830.00 $831.00 $832.00 $833.00 $834.00 $835.00 $836.00 $837.00 $838.00 $839.00 $840.00 $841.00 $842.00 $843.00 $844.00 $845.00 $846.00 $847.00 $848.00 $849.00 $850.00 $851.00 $852.00 $853.00 $854.00 $855.00 $856.00 $857.00 $858.00 $859.00 $860.00 $861.00 $862.00 $863.00 $864.00 $865.00 $866.00 $867.00 $868.00 $869.00 $870.00 $871.00 $872.00 $873.00 $874.00 $875.00 $876.00 $877.00 $878.00 $879.00 $880.00 $881.00 $882.00 $883.00 $884.00 $885.00 $886.00 $887.00 $888.00 $889.00 $890.00 $891.00 $892.00 $893.00 $894.00 $895.00 $896.00 $897.00 $898.00 $899.00 $900.00 $901.00 $902.00 $903.00 $904.00 $905.00 $906.00 $907.00 $908.00 $909.00 $910.00 $911.00 $912.00 $913.00 $914.00 $915.00 $916.00 $917.00 $918.00 $919.00 $920.00 $921.00 $922.00 $923.00 $924.00 $925.00 $926.00 $927.00 $928.00 $929.00 $930.00 $931.00 $932.00 $933.00 $934.00 $935.00 $936.00 $937.00 $938.00 $939.00 $940.00 $941.00 $942.00 $943.00 $944.00 $945.00 $946.00 $947.00 $948.00 $949.00 $950.00 $951.00 $952.00 $953.00 $954.00 $955.00 $956.00 $957.00 $958.00 $959.00 $960.00 $961.00 $962.00 $963.00 $964.00 $965.00 $966.00 $967.00 $968.00 $969.00 $970.00 $971.00 $972.00 $973.00 $974.00 $975.00 $976.00 $977.00 $978.00 $979.00 $980.00 $981.00 $982.00 $983.00 $984.00 $985.00 $986.00 $987.00 $988.00 $989.00 $990.00 $991.00 $992.00 $993.00 $994.00 $995.00 $996.00 $997.00 $998.00 $999.00 $1000.00

```



nqr7.log

```
1954 1963 2000 1.5 3.0 1.0 45.43 32.48 12.95
> gr SC_ LSB x if x<=75,ylab(0.25+.5*(35-x)/100),xlab(20,30,40,50,60,70),ylim(0,1)
> (-Proportion Still Alive and Smoking) saving(nqr7b.replace)
(Note: file nqr7a.gph not found)
```

form LSB SC\* 47.3t

form x 46.0f

keep x LSB SC\*

1. mod

x	LSB	SC_lo	SC_	SC_hi
1	1.000	1.000	1.000	1.000
2	1.000	1.000	1.000	1.000
3	1.000	1.000	1.000	1.000
4	0.994	0.990	0.994	0.998
5	0.990	0.984	0.990	0.992
6	0.977	0.962	0.977	0.993
7	0.973	0.956	0.973	0.992
8	0.967	0.945	0.967	0.993
9	0.963	0.937	0.963	0.990
10	0.959	0.930	0.959	0.989
11	0.954	0.922	0.954	0.865
12	0.951	0.917	0.951	0.856
13	0.946	0.908	0.946	0.841
14	0.939	0.895	0.939	0.818
15	0.934	0.886	0.934	0.803
16	0.925	0.869	0.925	0.776
17	0.922	0.863	0.922	0.765
18	0.910	0.842	0.910	0.731
19	0.900	0.823	0.900	0.701
20	0.895	0.814	0.895	0.688
21	0.891	0.806	0.891	0.675
22	0.883	0.792	0.883	0.654
23	0.873	0.773	0.873	0.625
24	0.859	0.749	0.859	0.590
25	0.852	0.736	0.852	0.571
26	0.835	0.708	0.835	0.531
27	0.822	0.685	0.822	0.500
28	0.810	0.665	0.810	0.475
29	0.791	0.634	0.791	0.435
30	0.776	0.611	0.776	0.407
31	0.760	0.587	0.760	0.379
32	0.742	0.560	0.742	0.349
33	0.730	0.544	0.730	0.332
34	0.706	0.512	0.706	0.299
35	0.695	0.499	0.695	0.287
36	0.678	0.479	0.678	0.268
37	0.659	0.457	0.659	0.250
38	0.642	0.437	0.642	0.233
39	0.618	0.413	0.618	0.214
40	0.596	0.392	0.596	0.199
41	0.573	0.370	0.573	0.184
42	0.559	0.357	0.559	0.175
43	0.536	0.338	0.536	0.163
44	0.510	0.314	0.510	0.151

save nqr7\_R2\_R1.replace  
(Note: file nqr7\_R2\_R1.dta not found)  
file nqr7\_R2\_R1.dta saved

log close

52614 0851

nqr8\_R2\_R1.do

```

* @RM500
* nqr8: BL-CF differences in mean smoke-years exposure
* based upon empirical smoke-survival curve and mortality
* of claimants in HRA audit files
* Relative risk quitting model hC(t) = 1 - (1 - R2)^(1 - R3)
* hC(t) = R2*hb(t) if T3 > year >= T2, where T2 = 1999
* hC(t) = R3*hb(t) if year >= T3, where T3 = T1
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)
* Scenario pre-88 misconduct Estimate R1 R2 R3
* BL 1.0 1.0 1.0
* CF low 1.0 2.1 1.0
* CF mid 1.5 3.0 1.0
* CF yes 2.0 3.9 1.0

* Input files: nqr, nqr4
clear
prog drop _all
set matsize R00
set rmsg off
set more off

* using nqr8, replace

* Cutoff years for changes in quit rates are global variables $T1, $T2, $T3
* Relative increase in quit rate (on or after year T1) is global variable SR1
* Relative increase in quit rate (on or after year T2) is global variable SR2
* Relative increase in quit rate (on or after year T3) is global variable SR3
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)

* (1) Conditional distribn of birth year pi() among 'past' ever smokers
use nqr
* Save distribution of yrborn in Matrix pi(t)
qui tab yrborn [vsw], matcell(pi) matrow(c_)
matrix pi = pi\_result(1)
matrix pi = t_ pi
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix drop c_
matrix list pi

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked
drop _all
* Get 1 and SB from nqr4 output
use nqr4
qui sum x
global xMin = r(min)
global N = _N

* LSB is proportion who are still smoking and alive
gen LSB = 1-SB
qui sum LSB
* EB is mean smoke-years taking mortality into account
global EB = r(mean)*$N
di "Mean smoke-years (BL) = ", $9.2f $EB
* LSBR3 = L(x)*SB(x)*R3; LSBR2 = L(x)*SB(x)*R2; LSBR1 = L(x)*SB(x)*R1
gen LSBR1 =
gen LSBR2 =
gen LSBR3 =
gen SC =

prog def LSC
$1 = T1, $2 = T2, $3 = T3, $4 = R1, $5 = R2, $6 = R3
global T1 = $1
global T2 = $2
global T3 = $3
global R1 = $4
global R2 = $5
global R3 = $6
* Check T3 > T2 > T1
if $T2 <= $T1 | $T3 <= $T2 {
  * invalid, $9.0f $T1,$T2,$T3
  quit
}
* Compute SB(x)*R1 and L(x)*SB(x)*R1
* Compute SB(x)*R2 and L(x)*SB(x)*R2
* Compute SB(x)*R3 and L(x)*SB(x)*R3
* Compute SC = SUM(t) pi(t)*L(x)*SB(x)*R3*SB(min(x,T1-t))^(1-R1)*
* SB(min(x,T2-t))^(1-R2)*SB(min(x,T3-t))^(1-R3) for all x
* Sum over index 'i' (rows of pi)
local i = 1
while 'i' <= $m {
  local t = pi('i',1)
  * 't' year of birth
  local u1 = $T1 - 't' - $xMin - 1
  local v1 = 'u1' + 1
  local u2 = $T2 - 't' - $xMin - 1
  local v2 = 'u2' + 1
  local u3 = min($T3 - 't' - $xMin - 1, $N)
  local v3 = 'u3' + 1
  * Compute intermediate 'areas'
  local A1 = SB('u1',1)^(1-SR1)
  local A2 = SB('u2',1)^(1-SR2)
  local A3 = SB('u3',1)^(1-SR3)
  * 'u3' > 'u2' > 'u1' required
  * Case A:
  if 'u3' <= 0 {
    qui replace SC = SC + pi('i',2) * LSBR3
  }
  * Case B:
  if 'u3' > 0 & 'u2' <= 0 {
    qui replace SC = SC + pi('i',2) * LSBR2 in 1/'u3'
  }
  if 'u3' <= $N {
    qui replace SC = SC + pi('i',2) * LSBR3 * A3 in 'v3'/$N
  }
  * Case C:
  else {
    if 'u2' > 0 & 'u1' <= 0 {
      qui replace SC = SC + pi('i',2) * LSBR1 in 1/'u2'
    }
    qui replace SC = SC + pi('i',2) * LSBR2 * A2 in 'v2'/'u3'
    if 'v3' <= $N {
      qui replace SC = SC + pi('i',2) * LSBR3 * A3 in 'v3'/$N
    }
  }
  * Case D:
  else {
    qui replace SC = SC + pi('i',2) * LSB in 1/'u1'
    qui replace SC = SC + pi('i',2) * LSBR1 * A1 in 'v1'/'u2'
    qui replace SC = SC + pi('i',2) * LSBR2 * A2 in 'v2'/'u3'
  }
  i++
}

```

52614 0852

nqr8\_R2\_R1.do

```

if 'v3' <= SN {
  qui replace SC = SC + pi('1',2) * LSR3 * 'A1' * 'A2' * 'A3' in 'v3'/SN
}
)
)
local i = 'i' + 1
)
qui sum SC
global EC = r(mean)*SN
di '7.0f ST1,7.0f ST2,7.0f ST3,8.1f SR1,8.1f SR2,8.1f SR3,8.2f SEB,8.2f SEC,8.2f
2f SEB - SEC
end

```

```

prog def rangeSC
di " T1 T2 T3 R1 R2 R3 XB XC deltaX"

```

```

LSC 1954 1963 2001 1.0 2.1 1.0
qui gen SC_Jo = SC
lab var SC_Jo "SC (R=1 post-2000) low est."
LSC 1954 1963 2001 1.0 2.1 2.1
LSC 1954 1963 2001 1.0 2.4 1.0
LSC 1954 1963 2001 1.0 3.0 1.0
LSC 1954 1963 2001 1.0 3.6 1.0
LSC 1954 1963 2001 1.5 2.4 1.0

```

```

*****Wecker Change: Change 3.0 and 1.5 to 1.0*****
LSC 1954 1963 2001 1.5 3.0 1.0
LSC 1954 1963 2001 1.0 1.0 1.0
*****End Wecker Change*****

```

```

qui gen SC_ = SC
lab var SC_ "SC (R=1 post-2000) middle est."
LSC 1954 1963 2001 1.5 3.0 3.0
qui gen SC3 = SC
lab var SC3 "SC (R=1 post-2000) middle est."
LSC 1954 1963 2001 1.5 3.6 1.0
LSC 1954 1963 2001 2.0 2.4 1.0
LSC 1954 1963 2001 2.0 3.0 1.0
LSC 1954 1963 2001 2.0 3.6 1.0
LSC 1954 1963 2001 2.0 3.9 1.0
qui gen SC_hi = SC
lab var SC_hi "SC (R=1 post-2000) high est."
LSC 1954 1963 2001 2.0 3.9 3.9
LSC 1954 1963 1999 1.5 3.0 1.0
LSC 1954 1963 2000 1.5 3.0 1.0

```

end

rangeSC

```

gr SC_LSB x if x<=75,ylab(0.25,.5,.75,1)xlabs(20,30,40,50,60,70)s(i)c(JJ)l1("Proportio
n Still Alive and Smoking")saving(nqr8a,replace)
gr SC_SCJ LSB x if x<=75,ylab(0.25,.5,.75,1)xlabs(20,30,40,50,60,70)s(i)c(JJ)l1("Pro
portion Still Alive and Smoking")saving(nqr8b,replace)

```

```

form LSB SC *7.3f
form x *6.0f

```

52614 0853

```

* Cutoff years for changes in quit rates are global variables $T1, $T2, $T3
* Relative increase in quit rate (on year $T1) as global variable $L1
* Relative increase in quit rate (on year $T2) as global variable $L2
* Relative increase in quit rate (on year $T3) as global variable $L3
* ($L1, $L2, $L3 can be any value, not just 1; they can be any value, not just 1999)

```

```

* (1) Conditional distribn of birth year pi() among 'past' ever smokers

```

```

use nqr

```

```

* Save distribution of yiborn in Matrix pi(t)
qui tab yiborn [x=w], matcell(pi) matrow(t_)

```

```

matrix pi = pi_result()

```

```

matrix pi = t_ pi

```

```

* m = number of rows of pi
* col 1 (year t), col 2 (pi(t))
matrix colnames pi = t pi(t)

```

```

global m = rowsof(pi)

```

```

matrix drop t_

```

```

*matrix list pi

```

```

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked

```

```

drop _all

```

```

* Get L and SB from nqr4 output
use nqr4

```

```

qui sum x

```

```

global xmin = r(min)

```

```

global N = _N

```

```

* LSB is proportion who are still smoking and alive

```

```

gen LSB = L*SB

```

```

qui sum LSB

```

```

* EB is mean smoke-years taking mortality into account
global EB = r(mean)*SN

```

```

* di Mean smoke-years (BL) = '19.25' $EB
mean smoke-years (BL) = 45.43

```

```

* LSBR1 = L(x)*SB(x)*R3; LSBR2 = L(x)*SB(x)*R2; LSBR1 = L(x)*SB(x)*R1

```

```

gen LSBR1 =

```

```

(R2 missing values generated)

```

```

gen LSBR2 =

```

```

(R2 missing values generated)

```

```

gen LSBR3 =

```

```

(R2 missing values generated)

```

```

gen SC =
(R2 missing values generated)

```

```

1. global T1 = $T1, T2 = $T2, T3 = $T3, R1 = $R1, R2 = $R2, R3 = $R3

```

```

2. global T2 = $T2

```

```

3. global T3 = $T3

```

```

4. global R1 = $R1

```

```

5. global R2 = $R2

```

```

6. global R3 = $R3

```

```

7. Check T3 > T2 > T1

```

```

8. di "Invalid " $9.0f $T1, $T2, $T3

```

```

9. exit

```

```

10. Compute SB(x) and L(x)*SB(x)*R1

```

```

11. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

12. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

13. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

14. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

15. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

16. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

17. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

18. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

19. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

20. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

21. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

22. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

23. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

24. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

25. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

26. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

27. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

28. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

29. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

30. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

31. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

32. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

33. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

34. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

35. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

36. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

37. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

38. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

39. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

40. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

41. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

42. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

```

43. Compute SB(x)*R1 and L(x)*SB(x)*R1

```

```

44. Compute SB(x)*R2 and L(x)*SB(x)*R2

```

```

45. Compute SB(x)*R3 and L(x)*SB(x)*R3

```

	46.	47.	48.	49.	50.	51.	52.	53.	54.	55.	56.	57.	58.	59.	60.	61.	62.	63.	64.	65.	66.	67.	68.	69.	70.	71.	72.	73.	74.	75.	76.	77.	78.	79.	80.	81.	82.	83.	84.	85.	86.	87.	88.	89.	90.	91.	92.	93.	94.	95.	96.	97.	98.	99.	100.	101.	102.	103.	104.	105.	106.	107.	108.	109.	110.	111.	112.	113.	114.	115.	116.	117.	118.	119.	120.	121.	122.	123.	124.	125.	126.	127.	128.	129.	130.	131.	132.	133.	134.	135.	136.	137.	138.	139.	140.	141.	142.	143.	144.	145.	146.	147.	148.	149.	150.	151.	152.	153.	154.	155.	156.	157.	158.	159.	160.	161.	162.	163.	164.	165.	166.	167.	168.	169.	170.	171.	172.	173.	174.	175.	176.	177.	178.	179.	180.	181.	182.	183.	184.	185.	186.	187.	188.	189.	190.	191.	192.	193.	194.	195.	196.	197.	198.	199.	200.	201.	202.	203.	204.	205.	206.	207.	208.	209.	210.	211.	212.	213.	214.	215.	216.	217.	218.	219.	220.	221.	222.	223.	224.	225.	226.	227.	228.	229.	230.	231.	232.	233.	234.	235.	236.	237.	238.	239.	240.	241.	242.	243.	244.	245.	246.	247.	248.	249.	250.	251.	252.	253.	254.	255.	256.	257.	258.	259.	260.	261.	262.	263.	264.	265.	266.	267.	268.	269.	270.	271.	272.	273.	274.	275.	276.	277.	278.	279.	280.	281.	282.	283.	284.	285.	286.	287.	288.	289.	290.	291.	292.	293.	294.	295.	296.	297.	298.	299.	300.	301.	302.	303.	304.	305.	306.	307.	308.	309.	310.	311.	312.	313.	314.	315.	316.	317.	318.	319.	320.	321.	322.	323.	324.	325.	326.	327.	328.	329.	330.	331.	332.	333.	334.	335.	336.	337.	338.	339.	340.	341.	342.	343.	344.	345.	346.	347.	348.	349.	350.	351.	352.	353.	354.	355.	356.	357.	358.	359.	360.	361.	362.	363.	364.	365.	366.	367.	368.	369.	370.	371.	372.	373.	374.	375.	376.	377.	378.	379.	380.	381.	382.	383.	384.	385.	386.	387.	388.	389.	390.	391.	392.	393.	394.	395.	396.	397.	398.	399.	400.	401.	402.	403.	404.	405.	406.	407.	408.	409.	410.	411.	412.	413.	414.	415.	416.	417.	418.	419.	420.	421.	422.	423.	424.	425.	426.	427.	428.	429.	430.	431.	432.	433.	434.	435.	436.	437.	438.	439.	440.	441.	442.	443.	444.	445.	446.	447.	448.	449.	450.	451.	452.	453.	454.	455.	456.	457.	458.	459.	460.	461.	462.	463.	464.	465.	466.	467.	468.	469.	470.	471.	472.	473.	474.	475.	476.	477.	478.	479.	480.	481.	482.	483.	484.	485.	486.	487.	488.	489.	490.	491.	492.	493.	494.	495.	496.	497.	498.	499.	500.	501.	502.	503.	504.	505.	506.	507.	508.	509.	510.	511.	512.	513.	514.	515.	516.	517.	518.	519.	520.	521.	522.	523.	524.	525.	526.	527.	528.	529.	530.	531.	532.	533.	534.	535.	536.	537.	538.	539.	540.	541.	542.	543.	544.	545.	546.	547.	548.	549.	550.	551.	552.	553.	554.	555.	556.	557.	558.	559.	560.	561.	562.</
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```

gr SC3_LSB x if xx=75,ylab(0.25,.5,.75,1)xlab(20,30,40,50,60,70)s(ii)c(JJ)11
+ JJJ11("Proportion Still Alive and Smoking")saving(ngr8a,replace)
>Note: file ngr8a.gph not found)

gr SC3_LSB x if xx=75,ylab(0.25,.5,.75,1)xlab(20,30,40,50,60,70)s(ii)c(
+ JJJ11("Proportion Still Alive and Smoking")saving(ngr8b,replace)
>Note: file ngr8b.gph not found)

```

form LSB SC 87.3f  
form x 86.0f  
keep x LSB SC.

```
keep x LSB SC.
```

1. mod

	x	LSB	SC_lo	SC_	SC_hi
1.	17	1.000	1.000	1.000	1.000
2.	18	1.000	1.000	1.000	1.000
3.	19	0.999	0.998	0.999	0.998
4.	20	0.994	0.993	0.994	0.994
5.	21	0.990	0.988	0.990	0.984
6.	22	0.977	0.973	0.977	0.961
7.	23	0.973	0.968	0.973	0.955
8.	24	0.967	0.960	0.967	0.943
9.	25	0.963	0.955	0.963	0.935
10.	26	0.959	0.950	0.959	0.927
11.	27	0.954	0.944	0.954	0.918
12.	28	0.951	0.940	0.951	0.912
13.	29	0.946	0.933	0.946	0.901
14.	30	0.939	0.923	0.939	0.885
15.	31	0.934	0.916	0.934	0.873
16.	32	0.925	0.903	0.925	0.852
17.	33	0.922	0.898	0.922	0.844
18.	34	0.910	0.881	0.910	0.816
19.	35	0.900	0.865	0.900	0.790
20.	36	0.895	0.858	0.895	0.778
21.	37	0.891	0.851	0.891	0.767
22.	38	0.883	0.838	0.883	0.747
23.	39	0.873	0.821	0.873	0.718
24.	40	0.859	0.798	0.859	0.683
25.	41	0.852	0.786	0.852	0.664
26.	42	0.835	0.758	0.835	0.622
27.	43	0.822	0.735	0.822	0.588

remove abortion-specific  
and general  
quit rate effects  
(part)

12.	qui gen SC <sub>1</sub> = SC	
13.	Lab var SC <sub>1</sub> - SC (R=1 post-2000) middle est.	
14.	LSC 1954 1963 2001 1.5 3.0 3.0	
15.	qui gen SC <sub>3</sub> = SC	
16.	Lab var SC <sub>3</sub> - SC (R=3 post-2000) middle est.	
17.	LSC 1954 1963 2001 1.5 3.6 1.0	
18.	LSC 1954 1963 2001 2.0 2.4 1.0	
19.	LSC 1954 1963 2001 2.0 3.0 1.0	
20.	LSC 1954 1963 2001 2.0 3.6 1.0	
21.	qui gen SC <sub>hi</sub> = SC	
22.	Lab var SC <sub>hi</sub> - SC (R=1 post-2000) high est.	
23.	LSC 1954 1963 2001 2.0 3.9 3.9	

25. LSC 1954 1963 1999 1.5 3.0 1.0  
25 LSC 1954 1963 2000 1.5 3.0 1.0

end

qr8.1og

28.	44	0.810	0.715	0.810	0.559
29.	45	0.791	0.682	0.791	0.513
30.	46	0.776	0.657	0.776	0.480
31.	47	0.760	0.631	0.760	0.444
32.	48	0.742	0.601	0.742	0.409
33.	49	0.730	0.582	0.730	0.380
34.	50	0.706	0.545	0.706	0.341
35.	51	0.695	0.529	0.695	0.323
36.	52	0.678	0.505	0.678	0.297
37.	53	0.659	0.478	0.659	0.270
38.	54	0.642	0.453	0.642	0.245
39.	55	0.618	0.422	0.618	0.216
40.	56	0.596	0.394	0.596	0.192
41.	57	0.573	0.366	0.573	0.168
42.	58	0.559	0.349	0.559	0.155
43.	59	0.536	0.324	0.536	0.137
44.	60	0.510	0.297	0.510	0.118
45.	61	0.492	0.279	0.492	0.107
46.	62	0.473	0.261	0.473	0.096
47.	63	0.448	0.238	0.448	0.083
48.	64	0.428	0.221	0.428	0.074
49.	65	0.411	0.207	0.411	0.067
50.	66	0.390	0.191	0.390	0.060
51.	67	0.374	0.179	0.374	0.055
52.	68	0.355	0.166	0.355	0.049
53.	69	0.335	0.152	0.335	0.044
54.	70	0.316	0.141	0.316	0.040
55.	71	0.299	0.130	0.299	0.036
56.	72	0.285	0.122	0.285	0.034
57.	73	0.273	0.116	0.273	0.032
58.	74	0.260	0.109	0.260	0.030
59.	75	0.250	0.104	0.250	0.028
60.	76	0.236	0.097	0.236	0.026
61.	77	0.222	0.091	0.222	0.024
62.	78	0.213	0.087	0.213	0.023
63.	79	0.203	0.083	0.203	0.022
64.	80	0.191	0.078	0.191	0.021
65.	81	0.176	0.071	0.176	0.019
66.	82	0.167	0.068	0.167	0.018
67.	83	0.161	0.065	0.161	0.017
68.	84	0.159	0.065	0.159	0.017
69.	85	0.158	0.064	0.158	0.017
70.	86	0.157	0.063	0.157	0.017
71.	87	0.149	0.060	0.149	0.016
72.	88	0.141	0.057	0.141	0.015
73.	89	0.127	0.051	0.127	0.014
74.	90	0.126	0.051	0.126	0.014
75.	91	0.126	0.051	0.126	0.014
76.	92	0.126	0.051	0.126	0.014
77.	93	0.126	0.051	0.126	0.014
78.	94	0.117	0.047	0.117	0.013
79.	95	0.117	0.047	0.117	0.013
80.	96	0.117	0.047	0.117	0.013
81.	97	0.117	0.047	0.117	0.013
82.	98	0.117	0.047	0.117	0.013

save nqr8\_R2\_R1, replace  
(Note: file nqr8\_R2\_R1.dta not found)  
file nqr8\_R2\_R1.dta saved

log close

52614 0856

```

* ORHS00
* ndx4: Combines output of nqr8 (quit-rate effect) and nqr6 (initiation-rate) effect
* to estimate delta X (change in mean lifetime years of smoking) for past claimants
* Produces low, med, and high estimates for Scenario with post-2000 misconduct
*
clear
prog drop _all_
set matsize 500
set tmsig off
set more off

log using ndx4, replace
* Future claimants: Effects of decreased initiation
use nqr6.r2
* Compute frequency distributions
prog def Freq
    qui gen fs_1 = F5_1 - F5_1[_n-1]
end

Freq B
Freq C_lo
Freq C
Freq C_hi
drop F*
drop in 1
format %7.3f
sum x %6.0f

* Combine with results on Past Claimants: Effect of Increase Quit Rates
merge x using nqr8.R2.R1
ren LSB SB
* Reverse sort order to compute conditional means
gen byte n = _N - _n

```

```

proc def CondMean
  qui replace SS_1 = SS_1[_n-1] if SS_1 == .
  qui gen MS_1 = sum(SS_1)
  qui replace MS_1 = MS_1/SS_1
end

```

```

* Compute Mean Years Smoked (X)
prog def mX
  qui gen ss_1 = r(_N) * ms_1
  qui sum ss_1
  global XS_1 = r(mean) * r(N)
  drop ss_1
end

```

52614 0857

\* Future claimants: Effects of decreased initiation

use f116j2

\* Compute frequency distributions

```
prog def Freq
  1. qui gen fS_1 = FS_1 - FS_1[_n-1]
  2. end
```

Freq B

Freq C\_lo

Freq C\_

Freq C\_hi

drop F\*

drop in 1

if observation deleted)

form f \* \$7.3f

form x \*6.0f

\* Combine with results on Past Claimants: Effect of Increase Quit Rates

merge x using q07a00\_r1

ren USB SB

\* Reverse sort order to compute conditional means

gen byte n = \_N - \_n

sort n

drop n

\* Compute Conditional means

prog def CondMean

```
  1. qui replace SS_1 = SS_1[_n-1] if SS_1 == .
  2. qui gen mS_1 = sum(SS_1)
  3. qui replace mS_1 = mS_1/SS_1
  4. end
```

CondMean B

CondMean C\_lo

CondMean C\_

CondMean C\_hi

keep x f \* m\*

form m \* \$7.3f

sort x

drop if fB == .

observations deleted)

produced by BARTC

in

mx C\_

HUMIDITY

32.2

prog def Results

```
  1. di "---- Decrease in mean years smoked ----"
  2. di "Post-2000 Low Middle High"
  3. di "Misconduct Est. Est. Est."
  4. di "No . $12.1f $XB - $XC_lo, $12.1f $XB - $XC_lo, $12.1f $XB - $XC_hi"
  5. end
```

Results

```
---- Decrease in mean years smoked ----
Post-2000 Low Middle High
Misconduct Est. Est. Est.
No 6.9 0.3 13.3
```

\* Convert results to matrix & save

\* matrix def dX = J(2,3,0)

\* matrix def dX = J(1,3,0)

\* matrix dX[1,1] = \$XB - \$XC\_lo

\* matrix dX[1,2] = \$XB - \$XC\_

\* matrix dX[1,3] = \$XB - \$XC\_hi

\* drop \_all

\* svmat dX

number of observations will be reset to 1  
Press any key to continue, or Break to abort  
obs was 0, now 1

\* gen byte Scenario = \_n

\* lab def Scenario 1 "No-Post2000" 2 "Post2000"

\* lab val Scenario Scenario

\* ren dX1 dX\_lo

\* ren dX2 dX



ndx4.log

ren dx3 dx\_hi

gen byte Era = 1

lab def Era 1 "Past" 2 "Future"

lab val Era Era

order Era Scenario dx\_lo dx\_hi

form dx: v9.2f

save ndx4\_R2\_r2\_R1. replace

(Note: file ndx4\_R2\_r2\_R1.dta not found)

file ndx4\_R2\_r2\_R1.dta saved

1

	Era	Scenario	dx_lo
1.	Past	No-Post2000	6.86

log close

dx  
0.35

dx  
13.1

produced by RJRTC

in

HUMPHREY

c-f. Harris's reduction in new smtgrs of 10.65

```

/* LIMDEP 7.0 source code:
Multivariate normal analysis of:
1. cumulative incidence of lung cancer (diedLC);
2. prevalence of parenchymal disease (pleural);
3. score on X-ray (Par);
4. abnormal pulmonary function by spirometric
determination of FVC (PFT); and
5. pleural injury (anyPleu)
This 'main' version assumes that there is no relationship between
smoking and pleural injury.
Exposure results based upon assumption of no misconduct post-2000.

/* Restrict analysis to main sample (2,243) rather than
extended sample (2,609) */
subject: new; w = 0 $
skip

/* RHS variables (including years smoked, age categories, and
categories of post-latency asbestos exposure as 'X' */
namelist: X = one, smokYrs, ageG*, T10_* $

/* Separate namelist with years smoked dropped for pleural disease
dose-response models only */
namelist: Xo = one, ageG*, T10_* $

/* Descriptive statistics (sample means) of RHS variables */
dstat: rhs = X $

/* Save sample mean values of X's (and constant) in X_BL,
which corresponds to baseline scenario (BL) */
matrix: Xmeans = part(LastDsta, 1, 7, 1, 1) $
/* Append 1 to vector of sample means */
matrix: u = {1} $
matrix: X_BL = {u / Xmeans} $

/* Construct conformal vector for Xo_BL */
dstat: rhs = Xo $
matrix: Xmeans = part(LastDsta, 1, 6, 1, 1) $
matrix: Xo_BL = {u / Xmeans} $

/* Univariate models: Show marginal effects.
Note: LIMDEP computes partial derivatives df/dxi, while
Stata by default shows discrete effects deltaF/deltaXi. */
probit: lhs = diedLC; rhs = X; marginal effects $
matrix: b_LC = B $
probit: lhs = Par; rhs = X; marginal effects $
matrix: b_Par = B $
probit: lhs = PFT; rhs = X; marginal effects $
matrix: b_PFT = B $

/* Note change in RHS for anyPleu */
probit: lhs = anyPleu; rhs = Xo; marginal effects $
matrix: b_Ple = B $

/* Pairwise Bivariate probit models */
bivariate: lhs = diedLC, Par; rhs = X; rh2 = X;
start = b_LC, b_Par; marginal effects $
matrix: b_LC = part(B, 1, 8) $
calc: rhoLCPar = rho $

```

```

bivariate: lhs = Par, PFT; rh1 = X; rh2 = X;
start = b_Par, b_PFT; marginal effects $
calc: rhoParPFT = rho $
bivariate: lhs = diedLC, PFT; rh1 = X; rh2 = X;
start = b_LC, b_PFT; marginal effects $
calc: rhoLCpft = rho $

/* Note change in RHS for anyPleu */
bivariate: lhs = diedLC, anyPleu; rh1 = X; rh2 = Xo;
start = b_LC, b_Ple; marginal effects $
calc: rhoLCple = rho $

/* Note change in RHS for anyPleu */
bivariate: lhs = Par, anyPleu; rh1 = X; rh2 = Xo;
start = b_Par, b_Ple; marginal effects $
calc: rhoParPle = rho $

/* Note change in RHS for anyPleu */
bivariate: lhs = PFT, anyPleu; rh1 = X; rh2 = Xo;
start = b_PFT, b_Ple; marginal effects $
calc: rhoPFTple = rho $

/* 4x4 Variance-covariance matrix for multivariate
normal calculations */
matrix: Omega4 = {1 /
rhoLCPar, 1 /
rhoLCpft, rhoParPFT, 1 /
rhoLCple, rhoParPle, rhoPFTple, 1} $

/* 3x3 Variance-covariance submatrix for multivariate
normal calculations */
matrix: Omega3 = part(Omega4, 1, 3, 1, 3) $

/* Computation of indices XB at (baseline) means of X
from probit models */
matrix: y_LC = X_BL'b_LC $
matrix: y_Par = X_BL'b_Par $
matrix: y_PFT = X_BL'b_PFT $
/* Note change in code for pleural */
matrix: y_Ple = Xo_BL'b_Ple $

/* Counterfactual values of indices (past) - no post-2000 misconduct */
matrix: y_LC_D = y_LC - 0.35*part(b_LC, 2, 2, 1, 1) $
matrix: y_LC_Phi = y_LC - 0.35*part(b_LC, 2, 2, 1, 1) $
matrix: y_LC_Plo = y_LC - 0.35*part(b_LC, 2, 2, 1, 1) $
matrix: y_Pa_D = y_Par - 0.35*part(b_Par, 2, 2, 1, 1) $
matrix: y_Pa_Phi = y_Par - 0.35*part(b_Par, 2, 2, 1, 1) $
matrix: y_Pa_Plo = y_Par - 0.35*part(b_Par, 2, 2, 1, 1) $
matrix: y_Pe_D = y_PFT - 0.35*part(b_PFT, 2, 2, 1, 1) $
matrix: y_Pe_Phi = y_PFT - 0.35*part(b_PFT, 2, 2, 1, 1) $
matrix: y_Pe_Plo = y_PFT - 0.35*part(b_PFT, 2, 2, 1, 1) $

/* Note change in code for pleural disease */
matrix: y_Pl_D = y_Ple $
matrix: y_Pl_Phi = y_Ple $
matrix: y_Pl_Plo = y_Ple $

/* Counterfactual values of indices (future) - no post-2000 misconduct */

```

Ms8a\_R2\_r2\_R1.lim

```

matrix: y_LC_f = y_LC - 12.08*Part(b_LC,2,2,1,1) $
matrix: y_LC_fhi = y_LC - 12.08*Part(b_LC,2,2,1,1) $
matrix: y_LC_flo = y_LC - 12.08*Part(b_LC,2,2,1,1) $
matrix: y_Pa_f = y_Pa - 12.08*Part(b_Pa,2,2,1,1) $
matrix: y_Pa_fhi = y_Pa - 12.08*Part(b_Pa,2,2,1,1) $
matrix: y_Pa_flo = y_Pa - 12.08*Part(b_Pa,2,2,1,1) $
matrix: y_PFT_f = y_PFT - 12.08*Part(b_PFT,2,2,1,1) $
matrix: y_PFT_fhi = y_PFT - 12.08*Part(b_PFT,2,2,1,1) $
matrix: y_PFT_flo = y_PFT - 12.08*Part(b_PFT,2,2,1,1) $

... Note change in code for pleural disease */
matrix: y_Ple = y_Ple $
matrix: y_Ple_fhi = y_Ple $
matrix: y_Ple_flo = y_Ple $

* Probability of still getting LC (p11) */
calc: p11 = phi(y_LC) $
calc: p11_p = phi(y_LC,p)/p_LC $
calc: p11_plo = phi(y_LC_plo)/p_LC $
calc: p11_phi = phi(y_LC_phi)/p_LC $
calc: p11_f = phi(y_LC_f)/p_LC $
calc: p11_flo = phi(y_LC_flo)/p_LC $
calc: p11_fhi = phi(y_LC_fhi)/p_LC $

* Probability of not getting LC but instead getting
Disabling BID (Par and PFT) (p21): as well as
Probability of not getting LC but instead getting
Non-disabling BID (Par and not PFT) (p31) */

* Use Greene's sign convention matrix (page 229) */
matrix: T = 1,0,0,1,0,0,0,-1) $
matrix: Omega3A = T*Omega3*T $

matrix: z0 = (y_LC / y_Pa_plo / y_PFT_plo) $
matrix: z1 = (y_LC_plo / y_Pa_plo / y_PFT_plo) $
calc: p21_plo = (MvN(z0, Omega3) - MvN(z1, Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_plo = (MvN(z0A, Omega3A) - MvN(z1A, Omega3A))/p_LC $

matrix: z0 = (y_LC / y_Pa_phi / y_PFT_phi) $
matrix: z1 = (y_LC_phi / y_Pa_phi / y_PFT_phi) $
calc: p21_phi = (MvN(z0, Omega3) - MvN(z1, Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_phi = (MvN(z0A, Omega3A) - MvN(z1A, Omega3A))/p_LC $

matrix: z0 = (y_LC / y_Pa_f / y_PFT_f) $
matrix: z1 = (y_LC_f / y_Pa_f / y_PFT_f) $
calc: p21_f = (MvN(z0, Omega3) - MvN(z1, Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_f = (MvN(z0A, Omega3A) - MvN(z1A, Omega3A))/p_LC $

matrix: z0 = (y_LC / y_Pa_flo / y_PFT_flo) $
matrix: z1 = (y_LC_flo / y_Pa_flo / y_PFT_flo) $
calc: p21_flo = (MvN(z0, Omega3) - MvN(z1, Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_flo = (MvN(z0A, Omega3A) - MvN(z1A, Omega3A))/p_LC $

```

```

matrix: z0 = (y_LC / y_Pa_flo / y_PFT_flo) $
matrix: z1 = (y_LC_flo / y_Pa_flo / y_PFT_flo) $
calc: p21_flo = (MvN(z0, Omega3) - MvN(z1, Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_flo = (MvN(z0A, Omega3A) - MvN(z1A, Omega3A))/p_LC $

matrix: z0 = (y_LC / y_Pa_fhi / y_PFT_fhi) $
matrix: z1 = (y_LC_fhi / y_Pa_fhi / y_PFT_fhi) $
calc: p21_fhi = (MvN(z0, Omega3) - MvN(z1, Omega3))/p_LC $
matrix: z0A = T*z0 $
matrix: z1A = T*z1 $
calc: p31_fhi = (MvN(z0A, Omega3A) - MvN(z1A, Omega3A))/p_LC $

/* Collect results in subdiagonal matrices and clean up */
matrix: P_D = Idem(4) $
matrix: P_Plo = phi(y_LC_plo) $
matrix: P_Phi = phi(y_LC_phi) $
matrix: P_Flo = phi(y_LC_flo) $
matrix: P_Fhi = phi(y_LC_fhi) $

matrix: P_P(1,1) = p11_p $
matrix: P_P(2,1) = p21_p $
matrix: P_P(3,1) = p31_p $
calc: delete p11_p, p21_p, p31_p $

matrix: P_Plo(1,1) = p11_plo $
matrix: P_Plo(2,1) = p21_plo $
matrix: P_Plo(3,1) = p31_plo $
calc: delete p11_plo, p21_plo, p31_plo $

matrix: P_Phi(1,1) = p11_phi $
matrix: P_Phi(2,1) = p21_phi $
matrix: P_Phi(3,1) = p31_phi $
calc: delete p11_phi, p21_phi, p31_phi $

matrix: P_f(1,1) = p11_f $
matrix: P_f(2,1) = p21_f $
matrix: P_f(3,1) = p31_f $
calc: delete p11_f, p21_f, p31_f $

matrix: P_flo(1,1) = p11_flo $
matrix: P_flo(2,1) = p21_flo $
matrix: P_flo(3,1) = p31_flo $
calc: delete p11_flo, p21_flo, p31_flo $

matrix: P_fhi(1,1) = p11_fhi $
matrix: P_fhi(2,1) = p21_fhi $
matrix: P_fhi(3,1) = p31_fhi $
calc: delete p11_fhi, p21_fhi, p31_fhi $

/* Probability of not getting LC but instead getting
Pleural disease only (p41) */
/* Construct new 3x3 submatrix of Omega4 that gives only
correlations of LC, Par, and Pl */
matrix: Omega3 = 1 /
              rhoLCPar, 1 /
              rhoLCple, rhoParPl, 1) $

/* As before, use Greene's sign convention matrix (page 229) */
matrix: T = 1,0,0,0,-1,0,0,0,1) $
matrix: Omega3A = T*Omega3*T $

```

Produced by HUMILITY



Ms8a\_R2\_r2\_R1.1im

```
matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_P] $
matrix: z1 = [Y_LC / Y_Pa_P / Y_PFT / Y_PL_P] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_P = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Plo] $
matrix: z1 = [Y_LC / Y_Pa_Plo / Y_PFT / Y_PL_Plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_Plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Phi] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT / Y_PL_Phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_Phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_f] $
matrix: z1 = [Y_LC / Y_Pa_f / Y_PFT / Y_PL_f] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_f = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_flo] $
matrix: z1 = [Y_LC / Y_Pa_flo / Y_PFT / Y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_fhi] $
matrix: z1 = [Y_LC / Y_Pa_fhi / Y_PFT / Y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

/* Collect results and clean up. */
matrix: p42_P = p42_P $
matrix: p42_Plo = p42_Plo $
matrix: p42_Phi = p42_Phi $
matrix: p42_f = p42_f $
matrix: p42_flo = p42_flo $
matrix: p42_fhi = p42_fhi $

/* Probability of NBID in BL */
matrix: Omega3 = Part(Omega4, 1, 3, 1, 3) $
matrix: Omega3A = T*Omega3-T $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_P] $
matrix: z1 = [Y_LC / Y_Pa_P / Y_PFT / Y_PL_P] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_P = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Plo] $
matrix: z1 = [Y_LC / Y_Pa_Plo / Y_PFT / Y_PL_Plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_Plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Phi] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT / Y_PL_Phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_Phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_f] $
matrix: z1 = [Y_LC / Y_Pa_f / Y_PFT / Y_PL_f] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_f = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_flo] $
matrix: z1 = [Y_LC / Y_Pa_flo / Y_PFT / Y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_fhi] $
matrix: z1 = [Y_LC / Y_Pa_fhi / Y_PFT / Y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $
```

```
matrix: z0 = [Y_LC / Y_Pa_Phi / Y_PFT] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_f = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Pa_flo / Y_PFT] $
matrix: z1 = [Y_LC / Y_Pa_flo / Y_PFT] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Pa_fhi / Y_PFT] $
matrix: z1 = [Y_LC / Y_Pa_fhi / Y_PFT] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

/* Probability of Pl but not NBID in CF given NBID in BL */
/* Use Omega4 matrix */
matrix: T = [-1.0, 0.0 / 0.1, 0.0 / 0.0, -1.0 / 0.0, 0.1] $
matrix: Omega4A = T*Omega4-T $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_P] $
matrix: z1 = [Y_LC / Y_Pa_P / Y_PFT / Y_PL_P] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_P = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Plo] $
matrix: z1 = [Y_LC / Y_Pa_Plo / Y_PFT / Y_PL_Plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_Plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_Phi] $
matrix: z1 = [Y_LC / Y_Pa_Phi / Y_PFT / Y_PL_Phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_Phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_f] $
matrix: z1 = [Y_LC / Y_Pa_f / Y_PFT / Y_PL_f] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_f = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_flo] $
matrix: z1 = [Y_LC / Y_Pa_flo / Y_PFT / Y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [Y_LC / Y_Par / Y_PFT / Y_PL_fhi] $
matrix: z1 = [Y_LC / Y_Pa_fhi / Y_PFT / Y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $
```

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```
matrix: z1a = T*zi $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1a, Omega4A))/p_NBID $
```

```
/* Collect results and clean up. */
```

```
matrix: P_p43_p = p43_p $
matrix: P_p43_lo = p43_lo $
matrix: P_p43_fhi = p43_fhi $
matrix: P_f43_f = p43_f $
matrix: P_f43_lo = p43_lo $
matrix: P_f43_fhi = p43_fhi $
calc: delete p43_p, p43_lo, p43_fhi $
calc: delete p43_f, p43_lo, p43_fhi $
```

```
/* Probability of pleural injury in BL. */
/* Recreate 3x3 submatrix of Omega4 that gives only
   correlations of LC, Par, and Pl. */
```

```
matrix: Omega3 = [ [ ,
                    rhoLCPar, 1/
                    rhoLCPl, rhoParPl, 1 ] $
matrix: T = [-1.0, 0.0 / 0.0, -1.0 / 0.0, 1.0] $
matrix: Omega3A = T*Omega3*T $
matrix: z0 = [y_LC / y_Par / y_Ple ] $
matrix: z0A = T*z0 $
calc: p_Pl = Mvn(z0A, Omega3A) $
```

```
/* Probability of Pl in CF given Pl in BL. */
```

```
matrix: z1a = T*zi $
matrix: z1a = T*zi $
calc: p44_Pl = Mvn(z1a, Omega3A)/p_Pl $
matrix: z1 = [y_LC / y_Par / y_Pl_plo] $
matrix: z1a = T*z1 $
matrix: z1a = T*z1 $
calc: p44_Pl = Mvn(z1a, Omega3A)/p_Pl $
```

```
matrix: z1 = [y_LC / y_Par / y_Pl_f] $
matrix: z1a = T*z1 $
matrix: z1a = T*z1 $
calc: p44_Pl = Mvn(z1a, Omega3A)/p_Pl $
```

```
matrix: z1 = [y_LC / y_Par / y_Pl_flo] $
matrix: z1a = T*z1 $
matrix: z1a = T*z1 $
calc: p44_Pl = Mvn(z1a, Omega3A)/p_Pl $
```

```
matrix: z1 = [y_LC / y_Par / y_Pl_fhi] $
matrix: z1a = T*z1 $
matrix: z1a = T*z1 $
calc: p44_Pl = Mvn(z1a, Omega3A)/p_Pl $
```

```
/* Collect results and clean up. */
matrix: z1a = T*zi $
matrix: z1a = T*zi $
calc: p44_Pl = Mvn(z1a, Omega3A)/p_Pl $
```

Tab 73, p.1

```
matrix: z1a = T*zi $
matrix: z1a = T*zi $
calc: delete p44_Pl, p44_Pl_flo, p44_Pl_fhi $
calc: delete p44_Pl_f, p44_Pl_flo, p44_Pl_fhi $
```

# produced by RJRTC in HUMPHREY

```

* @R500*
* DMS: Computation of present discounted value (PDV)
* of 'past' non-FDQ resolved and unresolved claims.
* Input files: lv6: "Risk Free Interest Rates"
* This version is used ms7a as input file. No effect on program
* clear
* Program modifies DM3
prog drop _all
set rmsg off
set more off
set matsize 500

log using dm5_ms8a, replace

* (10) Liquidated value of unresolved claims (based on TDP)
* from [MatrixREV95.xls]Unresolved:
matrix U = (89400, 25400, 51500, 12500)
matrix colnames U = LC NBID DBID PI
matrix rownames U = LiqVal

* Administrative costs per claim from [MatrixREV95.xls]admin_costs
matrix C = (577, 210)
matrix colnames C = past unres
matrix colnames C = ad_cost
matrix li C

* (1) Compute discount factors
use Risk Free Interest Rate
drop 1998-1991 (Courts' Preliminary Orders cover only 1992+)
drop in 1/4
qui gen n = 2000 - _n
sort n
qui dFactor = 1 in 1
qui replace df = df[_n-1]*(1 + 1/100) in 2/9
form df t9.3f
sort y
drop n 1

* (2) Merge with lv6; incl. admin costs and unresolved claims
merge year using lv6
drop _m

* Estimated Liquidated Values of Unresolved Claims
qui replace VR_LC = U(1,1) if y == 2000
qui replace VS_LC = U(1,1) if y == 2000
qui replace VR_NBID = U(1,2) if y == 2000
qui replace VS_NBID = U(1,2) if y == 2000
qui replace VR_DBID = U(1,3) if y == 2000
qui replace VS_DBID = U(1,3) if y == 2000
qui replace VR_PI = U(1,4) if y == 2000
qui replace VS_PI = U(1,4) if y == 2000

* Add admin costs of past resolved claims to LiqVals
qui replace VR_LC = VR_LC + C(1,1) if y < 2000
qui replace VR_NBID = VR_NBID + C(1,1) if y < 2000
qui replace VR_DBID = VR_DBID + C(1,1) if y < 2000
qui replace VR_PI = VR_PI + C(1,1) if y < 2000
qui replace VS_LC = VS_LC + C(1,1) if y < 2000
qui replace VS_NBID = VS_NBID + C(1,1) if y < 2000
qui replace VS_DBID = VS_DBID + C(1,1) if y < 2000
qui replace VS_PI = VS_PI + C(1,1) if y < 2000

```

```

* Add admin costs to unresolved claims to LiqVals
qui replace VR_LC = VR_LC + C(2,1) if y == 2000
qui replace VR_NBID = VR_NBID + C(2,1) if y == 2000
qui replace VR_DBID = VR_DBID + C(2,1) if y == 2000
qui replace VR_PI = VR_PI + C(2,1) if y == 2000
qui replace VS_LC = VS_LC + C(2,1) if y == 2000
qui replace VS_NBID = VS_NBID + C(2,1) if y == 2000
qui replace VS_DBID = VS_DBID + C(2,1) if y == 2000
qui replace VS_PI = VS_PI + C(2,1) if y == 2000

* (3) Compute PDV of Liq Val + Admin Costs by Dx and Year
qui replace VR_LC = VR_LC + df
qui replace VR_NBID = VR_NBID + df
qui replace VR_DBID = VR_DBID + df
qui replace VR_PI = VR_PI + df
qui replace VS_LC = VS_LC + df
qui replace VS_NBID = VS_NBID + df
qui replace VS_DBID = VS_DBID + df
qui replace VS_PI = VS_PI + df
drop df

* (4) Convert to matrices (Note: Order needs to be conformal with
* order of rows in subdiagonal P-matrices in ms7a and ms7)
* RICO
qui replace YR_LC = 0 if YR_LC == .
qui replace YR_NBID = 0 if YR_NBID == .
qui replace YR_DBID = 0 if YR_DBID == .
qui replace YR_PI = 0 if YR_PI == .
mkmat YR_LC
mkmat YR_NBID
mkmat YR_DBID
mkmat YR_PI
matrix YR = YR_LC, YR_NBID, YR_DBID, YR_PI
matrix colnames YR = LC DBID NBID PI
matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YR, format(%8.0f) title("RICO Claims by Dx Year")

qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_PI = 0 if VR_PI == .
mkmat VR_LC
mkmat VR_NBID
mkmat VR_DBID
mkmat VR_PI
matrix VR = VR_LC, VR_DBID, VR_NBID, VR_PI
matrix drop VR_LC VR_NBID VR_DBID VR_PI
matrix colnames VR = LC DBID NBID PI
matrix rownames VR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VR, format(%8.0f) title("RICO PDV LiqVal+AdminCost by Dx Year")

* SFA
qui replace VS_LC = 0 if VS_LC == .
qui replace VS_NBID = 0 if VS_NBID == .
qui replace VS_DBID = 0 if VS_DBID == .
qui replace VS_PI = 0 if VS_PI == .
mkmat VS_LC
mkmat VS_NBID
mkmat VS_DBID
mkmat VS_PI
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_PI
matrix drop VS_LC VS_DBID VS_NBID VS_PI
matrix colnames VS = LC DBID NBID PI

```

```
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VS, format(%8.0f) title('SFA Claims by Dx Year')
```

```
qui replace VS_LC = 0 if VS_LC == .
qui replace VS_NBID = 0 if VS_NBID == .
qui replace VS_DBID = 0 if VS_DBID == .
qui replace VS_P1 = 0 if VS_P1 == .
mkmat VS_LC
mkmat VS_NBID
mkmat VS_DBID
mkmat VS_P1
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_P1
matrix drop VS_LC VS_NBID VS_DBID VS_P1
matrix colnames VS = LC DBID NBID P1
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VS, format(%8.0f) title('SFA PDV LiqVal-AdmCost by Dx Year')
```

```
*) (J) Get P-matrix from ms7a
Note: This file has a slightly format than crl (as used in ms7a)
```

```
drop all
use ms8a_R2_r2_R1
*) Use only past estimates of P-matrix
keep if Era == 0
```

```
l, nod
*) Loop through (low,med,high) (n = 1,2,3)
```

```
qui gen double PDV_RICO = .
```

```
qui gen double PDV_SFA = .
```

```
form PDV* %9.1f
```

```
matrix P = J(4,4,0)
```

```
prog Gef getPDV
```

```
global n = 1
```

```
while %n <= 3 {
```

```
matrix P(1,1) = p11(%n)
```

```
matrix P(2,1) = p21(%n)
```

```
matrix P(1,2) = p22(%n)
```

```
matrix P(3,1) = p31(%n)
```

```
matrix P(3,2) = p32(%n)
```

```
matrix P(3,3) = p33(%n)
```

```
matrix P(4,1) = p41(%n)
```

```
matrix P(4,2) = p42(%n)
```

```
matrix P(4,3) = p43(%n)
```

```
matrix P(4,4) = p44(%n)
```

```
di -case: ", %n
```

```
matrix li P
```

```
*) Compute PDV for both RICO & SFA
```

```
matrix DR = trace(VR - (I(4) - P) * YR * P)
```

```
qui replace PDV_RICO = DR(1,1)/1e6 in %n
```

```
matrix DS = (P - (I(4) - P) * YR * P)
```

```
matrix trace(VS = DS(1,1)/1e6 in %n
```

```
qui replace PDV_SFA = DS(1,1)/1e6 in %n
```

```
Save results in median case (n=2) for graphs and tables
```

```
if %n == 2 {
```

```
FR and FS are annual financial injury from RICO and SFA
```

```
matrix x1 = vecdiag(VR - (I(4) - P) * YR * P)
```

```
matrix x2 = vecdiag(VS - (I(4) - P) * YR * P)
```

```
matrix x3 = FR
```

```
matrix x4 = FS
```

```
matrix x5 = P * YR
```

```
matrix x6 = P * P * YR
```

```
matrix x7 = ZR
```

```
matrix x8 = ZS
```

```
matrix x9 = ZR + ZS
```

```
matrix x10 = ZR + ZS
```

```
matrix x11 = ZR + ZS
```

```
matrix x12 = ZR + ZS
```

```
matrix x13 = ZR + ZS
```

Produced by RRTC

Financial injury by year

svmat FR

svmat FS

qui replace FR = FR/1e6

qui replace FS = FS/1e6

qui replace year = \_n + 1991

svmat ZR

svmat ZS

ren ZR1 ZR\_LC

ren ZR2 ZR\_NBID

ren ZR3 ZR\_DBID

svmat ZS

ren ZS1 ZS\_LC

ren ZS2 ZS\_DBID

ren ZS3 ZS\_NBID

ren ZS4 ZS\_P1

order Y FR FS ZR1 ZS1

form F\* Z\* %8.0f

l y F\*.nod

l y Z\*.nod

save Claims\_P.replace

log close

\032

HUMPHREY



```

. drop _m
* (0) Liquidated value of unresolved claims (based on TDP)
* from [MatrixREV95.xls]Unresolved:
matrix U = (84400, 25400, 51500, 12500)
matrix colnames U = LC NBID DBID PI
matrix rownames U = LiqVal
* Administrative costs per claim from [MatrixREV95.xls]admin_costs
matrix C = (577 \ 210)
matrix rownames C = past unres
matrix colnames C = ad_cost
matrix li C
C[2,1]
ad_cost
past 577
unres 210
* (1) Compute discount factors
use Risk Free Interest Rate
* Drop 1988-1991 (Courts' Preliminary Orders cover only 1992+)
drop in 1/4
(4 observations deleted)
qui use n = 2000 - _n
sort n
gen dFactor = 1 + 1 in 1
(4 missing values generated)
qui replace dF = dF[_n-1]*(1 + 1/100) in 2/9
form dF %9.3f
sort y
drop n 1
1
year Factor
1 1992 1.418
2 1993 1.370
3 1994 1.331
4 1995 1.281
5 1996 1.213
6 1997 1.153
7 1998 1.096
8 1999 1.045
9 2000 1.000
* (3) Compute PDV of Liq Val + Admin Costs by Dx and Year
qui replace VR_LC = VR_LC * dF
qui replace VR_NBID = VR_NBID * dF
qui replace VR_DBID = VR_DBID * dF

```

```

qui replace VR_P1 = VR_P1 * df
qui replace VS_LC = VS_LC * df
qui replace VR_NBID = VS_NBID * df
qui replace VS_DBID = VS_DBID * df
qui replace VS_P1 = VS_P1 * df
drop df

(4) Convert to matrices (Note: Order needs to be conformal with
order of rows in subdiagonal P-matrices in ms7a and ms7)
RICO
qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_P1 = 0 if VR_P1 == .
mkmat VR_LC
mkmat VR_NBID
mkmat VR_DBID
mkmat VR_P1

matrix YR = YR_LC, YR_DBID, YR_NBID, YR_P1
matrix drop YR_LC YR_NBID YR_DBID YR_P1
matrix colnames YR = LC DBID NBID P1
matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YR, format(%8.0f) title("RICO Claims by Dx Year")

YR(9,4): RICO Claims by Dx Year
LC DBID NBID P1
1992 0 0 0 0
1993 0 0 0 0
1994 0 0 0 0
1995 0 0 0 0
1996 460 50 41
1997 852 1165 1024
1998 109 852 1165 1024
1999 408 3823 3811
2000 2265 16423 24116 8291
2000 2960 15359 24575 10674

qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_P1 = 0 if VR_P1 == .
mkmat VR_LC

mkmat VR_NBID
mkmat VR_DBID
mkmat VR_P1

matrix YS = YS_LC, YS_DBID, YS_NBID, YS_P1
matrix drop YS_LC YS_NBID YS_DBID YS_P1
matrix colnames YS = LC DBID NBID P1
matrix rownames YS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YS, format(%8.0f) title("SFA Claims by Dx Year")

YS(9,4): SFA Claims by Dx Year
LC DBID NBID P1
1992 14 1 0 0
1993 17 2 0 0
1994 555 6 3 0
1995 933 44 30 21
1996 1612 1003 1356 3722
1997 2405 4262 7262 5453

mkmat VR_NBID
mkmat VR_DBID
mkmat VR_P1
matrix VR = VR_LC, VR_DBID, VR_NBID, VR_P1
matrix drop VR_LC VR_NBID VR_DBID VR_P1
matrix colnames VR = LC DBID NBID P1
matrix rownames VR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VR, format(%8.0f) title("RICO PDV LiqVal*AdmCost by Dx Year")

(5) RICO PDV LiqVal*AdmCost by Dx Year
LC DBID NBID P1
1992 0 0 0 0
1993 0 0 0 0
1994 0 0 0 0
1995 0 0 0 0
1996 106213 61370 31035 15261
1997 101419 58751 29730 14549
1998 96865 55924 28138 13853
1999 92414 52990 26774 12980
2000 88610 51710 25610 12710

* SFA
qui replace YS_LC = 0 if YS_LC == .
qui replace YS_NBID = 0 if YS_NBID == .
qui replace YS_DBID = 0 if YS_DBID == .
qui replace YS_P1 = 0 if YS_P1 == .
mkmat YS_LC
mkmat YS_NBID
mkmat YS_DBID
mkmat YS_P1

matrix YS = YS_LC, YS_DBID, YS_NBID, YS_P1
matrix drop YS_LC YS_NBID YS_DBID YS_P1
matrix colnames YS = LC DBID NBID P1
matrix rownames YS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YS, format(%8.0f) title("SFA Claims by Dx Year")

```

```

1998 2111 3967 6992 5907
1999 2653 2284 35603 12023
2000 3685 20135 30318 13653

```

```

qui replace VS_LC = 0 if VS_LC == .
qui replace VS_NBID = 0 if VS_NBID == .
qui replace VS_DBID = 0 if VS_DBID == .
qui replace VS_P1 = 0 if VS_P1 == .

```

```
mkmat VS_LC
```

```
mkmat VS_DBID
```

```
mkmat VS_NBID
```

```
mkmat VS_P1
```

```
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_P1
```

```
matrix drop VS_LC VS_NBID VS_DBID VS_P1
```

```
matrix colnames VS = LC DBID NBID P1
```

```
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
```

```
matrix li VS, format(%r,Of) title("SFA PDV LiqVal+AdmCost by DX Year")
```

```
VS[9,4]: SFA KUV LiqVal+AdmCost by DX Year
```

	LC	DBID	NBID	P1
1992	159788	71719	818	818
1993	131377	69287	790	790
1994	115516	72882	34051	768
1995	113591	69612	31136	16613
1996	106310	62012	31374	15464
1997	101889	59378	30011	14811
1998	97037	56279	28231	13909
1999	92715	52772	26779	12661
2000	88610	51710	25610	12710

```
* (4) Get P-matrix from ms7a
```

```
* Note: This file has a slightly format than cr1 (as used in dm3)
```

```
drop _all
```

```
use(ms7a_R2_x2_R1)
```

```
* Use only 'best' estimates of P-matrix
* keep if Era == 0
(3 observations deleted)
```

```
* 1.nod
```

	Era	Range	p11	p21	p31	p41	p22	p32
>	p33	p41	p42	p43	p44			
>	1.	Past	Lo	0.9790	0.0070	0.0070	0.9923	0.0040
>	2.	Past	Med	0.0035	0.0029	0.0029	0.0031	0.0040
>	3.	Past	Hi	0.9956	0.0035	0.0029	0.9923	0.0040
>				0.0031	0.0090	0.0090	1.0000	

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```
* Loop through (low,med,high) (n = 1,2,3)
```

```
qui gen double PDV_RICO = .
```

```
qui gen double SFA = .
```

```
to p11 99.11
```

```
matrix p = J(4,4,0)
```

```
* prog def getPDV
```

```
1. global n = 1
```

```
2. while Sn <= 3 (
```

```
matrix p(1,1) = p11(Sn)
```

```
matrix p(2,1) = p21(Sn)
```

```
5. matrix p(2,2) = p22(Sn)
```

```
6. matrix p(3,1) = p31(Sn)
```

```
7. matrix p(3,2) = p32(Sn)
```

```
8. matrix p(3,3) = p33(Sn)
```

```
9. matrix p(4,1) = p41(Sn)
```

```
10. matrix p(4,2) = p42(Sn)
```

```
11. matrix p(4,3) = p43(Sn)
```

```
12. matrix p(4,4) = p44(Sn)
```

```
13. di "case: ", Sn
```

```
14. matrix li p
```

```
15. * Compute PDV for both RICO & SFA
```

```
matrix DR = trace(VR * (I(4) - P) * YR')
```

```
16. qui replace PDV_RICO = DR(1,1)/le6 in Sn
```

```
17. matrix DS = trace(VS * (I(4) - P) * YS')
```

```
18. qui replace PDV_SFA = DS(1,1)/le6 in Sn
```

```
19. * Save results in median case (n=2) for graphs and tables
```

```
if Sn == 2 (
```

```
20. * FR and FS are annual financial injury from RICO and SFA
```

```
matrix FR = vecdiag(VR * (I(4) - P) * YR')
```

```
21. matrix FS = vecdiag(VS * (I(4) - P) * YS')
```

```
22. matrix FR = FR'
```

```
23. matrix FS = FS'
```

```
24. * ZR and ZS are annual claims by Dx in counterfactual scenario (median cas
```

```
> e)
```

```
25. matrix ZR = P * YR'
```

```
26. matrix ZS = P * YS'
```

```
27. matrix ZR = ZR'
```

```
28. matrix ZS = ZS'
```

```
29. global n = Sn + 1
```

```
30. )
```

```
31. end
```

```
* getPDV
```

```
case: 1
```

```
P(4,4)
```

	c1	c2	c3	c4
r1	.9789997	0	0	0
r2	.007	.9922997	0	0
r3	.009	.004	.9955999	0
r4	.0035	.0031	.0029	1

```
case: 2
```

	c1	c2	c3	c4
r1	.9789997	0	0	0
r2	.007	.9922997	0	0
r3	.009	.004	.9955999	0

```
14 .0035 .0031 .0029 1
case: 3
```

```
P(3,4)
11 .9789997 0 c3
12 .007 .9922997 0 c3
13 .009 .004 .9959999 0
14 .0035 .0031 .0029 1
```

```
1 Era Range PDV_R PDV_S.nod
```

```
1. Era Range PDV_R PDV_S.nod
2. Past Lo PDV_SPA
3. Past MeJ PDV_SPA
4. Past Hi PDV_SPA
```

```
1. Display results for median case for graphs and tables
drop _all
```

```
1. Financial injury by year
svmat FR
number of observations will be reset to 9
Press any key to continue, or Break to abort
obs was 0, now 9
```

```
svmat FS
```

```
qui replace FR = FR/1e6
```

```
qui replace FS = FS/1e6
```

```
gen int year = _n * 1991
```

```
svmat ZR
```

```
ren ZR1 ZR_LC
```

```
ren ZR2 ZR_DBID
```

```
ren ZR3 ZR_NBID
```

```
ren ZR4 ZR_P1
```

```
svmat ZS
```

```
ren ZS1 ZS_LC
```

```
ren ZS2 ZS_DBID
```

```
ren ZS3 ZS_NBID
```

```
ren ZS4 ZS_P1
```

```
order y FR FS ZR ZS
```

```
format y z * %A.01
```

```
1 y F*.nod
```

```
year
```

```
1991
```

```
1992
```

```
1993
```

```
FR1
```

```
0
```

```
0
```

```
0
```

```
FS2
```

```
0
```

```
0
```

```
0
```

produced by RJRTC

HUMPHREY

Year	ZR_LC	ZR_DBID	ZR_NBID	ZR_P1	ZS_LC	ZS_DBID	ZS
1994	0	0	0	0	14	1	1
1995	0	0	0	0	17	2	2
1996	0	0	0	0	543	10	10
1997	0	0	0	0	913	50	50
1998	0	0	0	0	1578	1007	1007
1999	0	0	0	0	2354	4246	4246
2000	0	0	0	0	2067	3951	3951
2001	0	0	0	0	2597	22131	22131
2002	0	0	0	0	3608	20006	20006

```
save Claims_P.replace
(Note: file Claims_P.dta not found)
file Claims_P.dta saved
```

```
log close
```

goto:

tab 73, p. 5 (formatted)

WEW 3, p. 4, Jan 14

Wecker changes:

- remove adjustment-specific quit and initiation rate effects (see p. 15, 26 this tab)  
R2, 3, 10 → 1, 10, R2, 10, 19 → 1, 10  
- remove general quit rate effect (see p. 26 this tab) IR past, QR past

R1: 1.5 → 1.0

41

Calc. Td73, P6

nir5\_r2\_r1.do

```

* @HMS00
nir5: BL-CF Differences in proportion of ever-smokers and
mean smoke-years exposure of claimants in HRA audit files.
* Relative risk initiation model hc(t) = r1*hr(t) if year >= T1
* hc(t) = r2*hr(t) if year >= T2, where T2 = 1973
* hc(t) = r3*hr(t) if year >= T3, where T3 = 1975
* (R3 can be any value, not just 1; T3 is the only value, not just 1)
* Age distribution for future claimants from age9.dta
* Baseline cumulative smoking initiation curve from nir3.dta
* Crossover insulators excluded

* Scenario pre-hr misconduct Estimate r1 r2 r3
BL 1.0 1.0 1.0
CF yes 1.0 0.8 1.0
CF yes 0.9 0.7 1.0
CF yes 0.8 0.6 1.0

* Clear
* drop _all
* get rnsy off
* set more off
* set matsize 200

* Load using nir5, replace
* (1) get distribution of birth year of all claimants from age9.dta
use "age9"
keep year AllFuture
matrices pi = Year AllFuture
matrix drop year AllFuture
* m = number of rows of pi
* col 1 (year) col 2 (pi(t))
matrices colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi

* No correction here for year first exposed to asbestos
* (Comparison of output of nir2 and nir3 shows little effect)

* (2) Get baseline cumulative initiation curve from nir3.dta
drop _all
use nir3_r2_r1
gen SB = 1 - FB
lab var x "Age"

* (3) Computation of initiation rates in CF scenario
* Cutoff years for decrease in initiation rates are $T1, max($T2, Y1exp), max($T3, Y1exp)
* Relative decrease in initiation rate (on or after year T1) is global variable $r1
* Relative decrease in initiation rate (on or after max($T2, Y1exp)) is global variable $
* Relative decrease in initiation rate (on or after max($T3, Y1exp)) is global variable $
* Note: x3 >= x2 >= x1
local u1 = 'x1' - $xMin
local v1 = 'x1' - $xMin + 1
local u2 = 'x2' - $xMin
local v2 = 'x2' - $xMin + 1
local u3 = 'x3' - $xMin
local v3 = 'x3' - $xMin + 1
Note: u3 >= u2 >= u1
local A1 = SB[u1,1]
local A2 = SB[u1,2]

* SB(x) cumulative proportion not smoking through age x in BL scenario.
sort x SB
order x SB
* Set xMax
* Age 50 set as cutoff for ever smoking
global xMax = 50
qui sum x
* min x leqobls

global N = _N
* Lifetime probability of not smoking by age $xMax in BL scenario
global PB = SB(xMax)
* Conditional survival curve in BL scenario
* (PB = 1 - SB(xMax))
* Mean age started among those starting by age $xMax in BL scenario
global XB = $xMin + x(mean)*$N
di "Probability of not smoking (by age $xMax) = ", XB/$N
di "Mean age started (among those starting by age $xMax) = ", XB/$N

* SB(x) = SB(x)*r1; SBR2 = SB(x)*r2; SBR1 = SB(x)*r1
* qui gen SBR1 =
* qui gen SBR2 =
* qui gen SBR3 =
* Check T3 > T2 > T1
* if $T2 <= $T1 | $T3 <= $T2 {
di "Invalid ", $T1, $T2, $T3
exit
}

* Compute SB(x)*r1 SB(x)*r2 SB(x)*r3
* qui replace SBR1 = SB*$r1
* qui replace SBR2 = SB*$r2
* qui replace SBR3 = SB*$r3
* qui replace SC = 0
* Compute SC = SUM(t) pi(t)*SB(min(x,T1-t))^(1-r1)*SB(min(x,T2-t))^(1-r2)*SB(min(x,T3-t))^(1-r3)
* Sum over index 'i' (rows of pi)
local i = 1
while 'i' <= $m {
local t = pi[i,1]
local p = pi[i,2]
* 'x1' = age at T1
local x1 = $T1 - 't'
* 'x2' = age at T2
local x2 = min($T2 - 't', $xMax)
* 'x3' = age at T3
local x3 = min($T3 - 't', $xMax)
* Note: x3 >= x2 >= x1
* 'v1' = obs# at age at T1
local u1 = 'x1' - $xMin
* 'v2' = obs# at age at T2
local u2 = 'x2' - $xMin + 1
* 'v3' = obs# at age at T3
local u3 = 'x3' - $xMin + 1
* Note: u3 >= u2 >= u1
local A1 = SB[u1,1]
local A2 = SB[u1,2]
}

```

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```

* Mean age started among those starting by age $xMax in CF scenario
Global XC = $xMin + r(mean)*$N
di $7.0f $7.1f $7.2f $7.3f $7.4f $7.5f $7.6f $7.7f $7.8f $7.9f $8.0f $8.1f $8.2f $8.3f $8.4f $8.5f $8.6f $8.7f $8.8f $8.9f $9.0f $9.1f $9.2f $9.3f $9.4f $9.5f $9.6f $9.7f $9.8f $9.9f $10.0f $10.1f $10.2f $10.3f $10.4f $10.5f $10.6f $10.7f $10.8f $10.9f $11.0f $11.1f $11.2f $11.3f $11.4f $11.5f $11.6f $11.7f $11.8f $11.9f $12.0f $12.1f $12.2f $12.3f $12.4f $12.5f $12.6f $12.7f $12.8f $12.9f $13.0f $13.1f $13.2f $13.3f $13.4f $13.5f $13.6f $13.7f $13.8f $13.9f $14.0f $14.1f $14.2f $14.3f $14.4f $14.5f $14.6f $14.7f $14.8f $14.9f $15.0f $15.1f $15.2f $15.3f $15.4f $15.5f $15.6f $15.7f $15.8f $15.9f $16.0f $16.1f $16.2f $16.3f $16.4f $16.5f $16.6f $16.7f $16.8f $16.9f $17.0f $17.1f $17.2f $17.3f $17.4f $17.5f $17.6f $17.7f $17.8f $17.9f $18.0f $18.1f $18.2f $18.3f $18.4f $18.5f $18.6f $18.7f $18.8f $18.9f $19.0f $19.1f $19.2f $19.3f $19.4f $19.5f $19.6f $19.7f $19.8f $19.9f $20.0f $20.1f $20.2f $20.3f $20.4f $20.5f $20.6f $20.7f $20.8f $20.9f $21.0f $21.1f $21.2f $21.3f $21.4f $21.5f $21.6f $21.7f $21.8f $21.9f $22.0f $22.1f $22.2f $22.3f $22.4f $22.5f $22.6f $22.7f $22.8f $22.9f $23.0f $23.1f $23.2f $23.3f $23.4f $23.5f $23.6f $23.7f $23.8f $23.9f $24.0f $24.1f $24.2f $24.3f $24.4f $24.5f $24.6f $24.7f $24.8f $24.9f $25.0f $25.1f $25.2f $25.3f $25.4f $25.5f $25.6f $25.7f $25.8f $25.9f $26.0f $26.1f $26.2f $26.3f $26.4f $26.5f $26.6f $26.7f $26.8f $26.9f $27.0f $27.1f $27.2f $27.3f $27.4f $27.5f $27.6f $27.7f $27.8f $27.9f $28.0f $28.1f $28.2f $28.3f $28.4f $28.5f $28.6f $28.7f $28.8f $28.9f $29.0f $29.1f $29.2f $29.3f $29.4f $29.5f $29.6f $29.7f $29.8f $29.9f $30.0f $30.1f $30.2f $30.3f $30.4f $30.5f $30.6f $30.7f $30.8f $30.9f $31.0f $31.1f $31.2f $31.3f $31.4f $31.5f $31.6f $31.7f $31.8f $31.9f $32.0f $32.1f $32.2f $32.3f $32.4f $32.5f $32.6f $32.7f $32.8f $32.9f $33.0f $33.1f $33.2f $33.3f $33.4f $33.5f $33.6f $33.7f $33.8f $33.9f $34.0f $34.1f $34.2f $34.3f $34.4f $34.5f $34.6f $34.7f $34.8f $34.9f $35.0f $35.1f $35.2f $35.3f $35.4f $35.5f $35.6f $35.7f $35.8f $35.9f $36.0f $36.1f $36.2f $36.3f $36.4f $36.5f $36.6f $36.7f $36.8f $36.9f $37.0f $37.1f $37.2f $37.3f $37.4f $37.5f $37.6f $37.7f $37.8f $37.9f $38.0f $38.1f $38.2f $38.3f $38.4f $38.5f $38.6f $38.7f $38.8f $38.9f $39.0f $39.1f $39.2f $39.3f $39.4f $39.5f $39.6f $39.7f $39.8f $39.9f $40.0f $40.1f $40.2f $40.3f $40.4f $40.5f $40.6f $40.7f $40.8f $40.9f $41.0f $41.1f $41.2f $41.3f $41.4f $41.5f $41.6f $41.7f $41.8f $41.9f $42.0f $42.1f $42.2f $42.3f $42.4f $42.5f $42.6f $42.7f $42.8f $42.9f $43.0f $43.1f $43.2f $43.3f $43.4f $43.5f $43.6f $43.7f $43.8f $43.9f $44.0f $44.1f $44.2f $44.3f $44.4f $44.5f $44.6f $44.7f $44.8f $44.9f $45.0f $45.1f $45.2f $45.3f $45.4f $45.5f $45.6f $45.7f $45.8f $45.9f $46.0f $46.1f $46.2f $46.3f $46.4f $46.5f $46.6f $46.7f $46.8f $46.9f $47.0f $47.1f $47.2f $47.3f $47.4f $47.5f $47.6f $47.7f $47.8f $47.9f $48.0f $48.1f $48.2f $48.3f $48.4f $48.5f $48.6f $48.7f $48.8f $48.9f $49.0f $49.1f $49.2f $49.3f $49.4f $49.5f $49.6f $49.7f $49.8f $49.9f $50.0f $50.1f $50.2f $50.3f $50.4f $50.5f $50.6f $50.7f $50.8f $50.9f $51.0f $51.1f $51.2f $51.3f $51.4f $51.5f $51.6f $51.7f $51.8f $51.9f $52.0f $52.1f $52.2f $52.3f $52.4f $52.5f $52.6f $52.7f $52.8f $52.9f $53.0f $53.1f $53.2f $53.3f $53.4f $53.5f $53.6f $53.7f $53.8f $53.9f $54.0f $54.1f $54.2f $54.3f $54.4f $54.5f $54.6f $54.7f $54.8f $54.9f $55.0f $55.1f $55.2f $55.3f $55.4f $55.5f $55.6f $55.7f $55.8f $55.9f $56.0f $56.1f $56.2f $56.3f $56.4f $56.5f $56.6f $56.7f $56.8f $56.9f $57.0f $57.1f $57.2f $57.3f $57.4f $57.5f $57.6f $57.7f $57.8f $57.9f $58.0f $58.1f $58.2f $58.3f $58.4f $58.5f $58.6f $58.7f $58.8f $58.9f $59.0f $59.1f $59.2f $59.3f $59.4f $59.5f $59.6f $59.7f $59.8f $59.9f $60.0f $60.1f $60.2f $60.3f $60.4f $60.5f $60.6f $60.7f $60.8f $60.9f $61.0f $61.1f $61.2f $61.3f $61.4f $61.5f $61.6f $61.7f $61.8f $61.9f $62.0f $62.1f $62.2f $62.3f $62.4f $62.5f $62.6f $62.7f $62.8f $62.9f $63.0f $63.1f $63.2f $63.3f $63.4f $63.5f $63.6f $63.7f $63.8f $63.9f $64.0f $64.1f $64.2f $64.3f $64.4f $64.5f $64.6f $64.7f $64.8f $64.9f $65.0f $65.1f $65.2f $65.3f $65.4f $65.5f $65.6f $65.7f $65.8f $65.9f $66.0f $66.1f $66.2f $66.3f $66.4f $66.5f $66.6f $66.7f $66.8f $66.9f $67.0f $67.1f $67.2f $67.3f $67.4f $67.5f $67.6f $67.7f $67.8f $67.9f $68.0f $68.1f $68.2f $68.3f $68.4f $68.5f $68.6f $68.7f $68.8f $68.9f $69.0f $69.1f $69.2f $69.3f $69.4f $69.5f $69.6f $69.7f $69.8f $69.9f $70.0f $70.1f $70.2f $70.3f $70.4f $70.5f $70.6f $70.7f $70.8f $70.9f $71.0f $71.1f $71.2f $71.3f $71.4f $71.5f $71.6f $71.7f $71.8f $71.9f $72.0f $72.1f $72.2f $72.3f $72.4f $72.5f $72.6f $72.7f $72.8f $72.9f $73.0f $73.1f $73.2f $73.3f $73.4f $73.5f $73.6f $73.7f $73.8f $73.9f $74.0f $74.1f $74.2f $74.3f $74.4f $74.5f $74.6f $74.7f $74.8f $74.9f $75.0f $75.1f $
```

nir5\_r2\_r1.do

```
prog def Results
di ---- Decrease in proportion smoked ---- High
di - Post-2000 Low Middle
di - Misconduct Est. Est.
di - Yes - .x12.3f FB(CN) - FC71o(SN) - FC71o(SN) - FC71o(SN) - FC71o(SN)
) di - No .x12.3f FB(CN) - FC71o(SN) - FC71o(SN) - FC71o(SN) - FC71o(SN)
end
Results
log close
) \032
```

Produced by RJRTC  
in

HUMPHREY

```
* (1) get distribution of birth year of all claimants from ages.dta
use "ages"
```

```
keep year AllFutur
```

```
mksmat year AllFutur
```

```
matrix pi = year.AllFutur
```

```
matrix drop year AllFutur
```

```
* m = number of rows of pi
* col 1 (year t), col 2:pi(t)
matrix colnames pi = t pi(t)
```

```
global m = rowsof(pi)
```

```
matrix list pi
```

```
pi[72,2]
```

```

1 1900 .0004112
2 1901 .00002101
3 1902 .00003102
4 1903 .00004548
5 1904 .00006578
6 1905 .00009443
7 1906 .00013421
8 1907 .0001888
9 1908 .00026279
10 1909 .00036178
11 1910 .00049251
12 1911 .00066282
13 1912 .00088162
14 1913 .00115874
15 1914 .00150459
16 1915 .00192976
17 1916 .00244442
18 1917 .00305756
19 1918 .00377616
20 1919 .00460425
21 1920 .00554198
22 1921 .00658479
23 1922 .00773278
24 1923 .00894043
25 1924 .01021674
26 1925 .01152602
27 1926 .01284937
28 1927 .01412696
29 1928 .0153611
30 1929 .01655004
31 1930 .0175923
32 1931 .018458097
33 1932 .01950742
34 1933 .02041352
35 1934 .02116119
36 1935 .02242851
37 1936 .02370143
38 1937 .02526133
39 1938 .02716919
40 1939 .02944484
41 1940 .03206937
42 1941 .0361640
43 1942 .03790151
44 1943 .04074331
45 1944 .04321814
46 1945 .050814
47 1946 .060816
48 1947 .070812
49 1948 .085827
50 1949 .04289862
51 1950 .03982827
52 1951 .03601309
53 1952 .03170149
54 1953 .02716146
55 1954 .0226488
56 1955 .01838121
57 1956 .01452142
58 1957 .01117046
59 1958 .00837014
60 1959 .0061117
61 1960 .0043592
62 1961 .0030385
63 1962 .0020583
64 1963 .00137566
65 1964 .00090207
66 1965 .00058381
67 1966 .00037486
68 1967 .0002404
69 1968 .00015518
70 1969 .00010166
71 1970 .0000681
72 1971 .00017831

```

```
* No correction here for year first exposed to asbestos
* (Comparison of output of nir2 and nir3 shows little effect)
```

```
* (2) Get baseline cumulative initiation curve from nir3.dta
drop _all
```

```
use nir3_r2_r1
```

```
gen SB = 1 - FB
```

```
lab var x "Age"
```

```
* (3) Computation of initiation rates in CF scenario
* Cutoff years for decrease in initiation rates are $r1, max($T2,Y1exp), max($T3,Y1exp)
* Relative decrease in initiation rate (on or after year T1) is global variab
* le $r1
* Relative decrease in initiation rate (on or after max($T2,Y1exp)) is global
* variable $r2
* Relative decrease in initiation rate (on or after max($T3,Y1exp)) is global
* variable $r3
```

```
* SB(x) cumulative proportion not smoking through age x in BL scenario.
keep x SB
```

```
sort x
```

```
order x SB
```

```
set x$max
```

```
Age 50 set as cutoff for ever smoking
```

```
global x$max = 50
```





```

27. qui gen FC7hi = 1 - SC
28. lab var FC7hi - FC (post-2000 Misconduct) high est.
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bolr5.lol

19.	0.614	0.614	0.654	0.579	0.541	0.541	0.554
20.	0.622	0.622	0.664	0.588	0.549	0.549	0.664
21.	0.629	0.629	0.671	0.594	0.555	0.555	0.671
22.	0.641	0.641	0.684	0.606	0.566	0.566	0.684
23.	0.648	0.648	0.691	0.613	0.573	0.573	0.691
24.	0.655	0.655	0.698	0.621	0.581	0.581	0.698
25.	0.662	0.662	0.705	0.628	0.588	0.588	0.705
26.	0.669	0.669	0.713	0.633	0.593	0.593	0.713
27.	0.675	0.675	0.720	0.639	0.598	0.598	0.720
28.	0.679	0.679	0.724	0.643	0.602	0.602	0.724
29.	0.682	0.682	0.727	0.645	0.604	0.604	0.727
30.	0.685	0.685	0.730	0.649	0.608	0.608	0.730
31.	0.687	0.687	0.732	0.651	0.609	0.609	0.732
32.	0.695	0.695	0.740	0.658	0.616	0.616	0.740
33.	0.697	0.697	0.743	0.660	0.619	0.619	0.743
34.	0.699	0.699	0.744	0.662	0.620	0.620	0.744
35.	0.700	0.700	0.746	0.663	0.621	0.621	0.746
36.	0.701	0.701	0.747	0.664	0.622	0.622	0.747
37.	0.704	0.704	0.750	0.667	0.625	0.625	0.750
38.	0.706	0.706	0.752	0.669	0.627	0.627	0.752
39.	0.708	0.708	0.754	0.670	0.629	0.629	0.754
40.	0.708	0.707	0.754	0.670	0.629	0.629	0.754
41.	0.709	0.709	0.755	0.672	0.630	0.630	0.755
42.	0.711	0.711	0.757	0.674	0.633	0.633	0.757

\* Compute changes in proportion who ever smoked

global N = 50  
Baseline scenario:  
di 49.3t FB(SN)  
0.757

prog def Results  
1. di ----- Decrease in proportion smoked  
2. di ----- Low Middle High  
3. di ----- Est. Est. Est.  
4. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
5. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
6. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
7. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
8. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
9. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
10. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
11. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
12. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
13. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
14. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
15. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
16. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
17. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
18. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
19. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
20. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
21. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
22. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
23. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
24. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
25. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
26. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
27. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
28. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
29. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
30. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
31. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
32. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
33. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
34. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
35. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
36. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
37. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
38. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
39. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
40. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
41. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
42. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
43. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
44. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
45. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
46. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
47. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
48. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
49. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)  
50. di ----- FC7(SN), 12.3t FB(SN) - FC7(SN), 12.3t FB(SN)

Results  
Post-2000  
Decrease in proportion smoked  
Low Middle High  
Est. Est. Est.  
Yes 0.000 0.083 0.126  
No 0.000 0.000 0.124

log close

52614 0877

```

* ORN500
* nir6: BL-CF differences in proportion of ever-smokers and
* mean smoke-years exposure of claimants in HRA audit files
* Relative risk initiation model bc(t) = 1 + r1*(t-T2) + r2*(t-T3)
* bc(t) = r2*HB(t) if year >= T2, where T2 = 1979
* bc(t) = r3*HB(t) if year >= T3, where T3 = 1999
* HB can be any value, not just 1; T3 can be any value, not just 1999
* T2 = max(T2,Ylexp), T3 = max(T3,Ylexp); Relative reduction r2 in
* initiation rate begins only after start of employment/exposure to asbestos

* Cross-over: Insulators excluded
* Scenario      pre-AR misconduct      Estimate      r1      r2      r3
* BL           yes                    low           1.0      1.0      1.0
* CF           yes                    mid           0.9      0.7      1.0
* CF           yes                    high          0.8      0.6      1.0

* Input files: (nir) concatenated HRA audit samples (from nir)
*
* Clear:
* prog drop all
* set msg off
* set more off
* set msize 200

* Using nir6, replace
* use nir, clear

* (1) Save distribution of yrborn in Matrix pi(t)
* Exclude observations for which yrbegan was imputed in nir1.do
* drop if !begin == 0
* Exclude observations for which date of first exposure to asbestos unknown
* drop if Ylexp == .
* (2) Tab yrborn (w=w), matcell(pi) matrow(t_)
* matrix pi = pi/_result(1)
* matrix pi = t_ pi
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
* matrix colnames pi = t pi(t)
* global m = rowsof(pi)
* matrix drop t_
* Distribution of year of birth
* matrix list pi

* Tabulate year first exposed to asbestos
* tab Ylexp [w=w], missing
* qui gen byte smk_exp = yrBegin < Ylexp
* lab var smk_exp "Began smoking before 1st employment with asbestos"
* tab smk_exp [w=w]

* (2) Set up duration variable for initiation analysis
* gen int ageEnd = ageBegin
* replace ageEnd = yrBorn - yrborn if ageEnd == .
* replace ageEnd = yrSett - yrborn if ageEnd == .
* replace ageEnd = yrRecv - yrborn if ageEnd == .
* pnsageEnd = ageEnd
* gen byte smoked = Smoker == 1

* (3) Compute initiation survival curve
* stset ageEnd [w=w], failure(Smoker) origin(time 0) scale(1) id(poc)
* sts generate SB = s
* form SB %9.3f
* gen byte x = _t
* lab var x "Age"
* gen FB = 1 - SB

```

```

form FB %9.3f
lab var FB "Cumul prop started smoking (BL)"
sort x
on if x==x(L-1)
total _N*
set obs n
qui sum
global xMin = r(min) - 1
replace x = $xMin in $N
replace FB = 0. in $N
replace SB = 1. in $N
* Form FB %9.0g
* Form FB %9.3f
* Form FB %9.3f
* Relative decrease in initiation rate (on or after year T1) is global variable $r1
* Relative decrease in initiation rate (on or after max(T2,Ylexp)) is global variable $r
* Relative decrease in initiation rate (on or after max(T3,Ylexp)) is global variable $r
1
* SB(x) cumulative proportion not smoking through age x in BL scenario.
keep SB x Ylexp

sort x
order x SB
* Set xMax
* Age 50 set as cutoff for ever smoking
global xMax = 50
drop if x > $xMax
qui sum x
global xMin = r(min)
global N = _N

* Lifetime probability of not smoking by age $xMax in BL scenario
global PB = SB($N)
* Conditional survival curve in BL scenario
qui gen SB_ = 1 - (1 - SB)/(1 - $PB)
qui sum SB_
* Mean age started among those starting by age $xMax in BL scenario
global XB = $xMin + r(mean)*$N
di "Probability of not smoking (by age $xMax) = ", $7.3f $PB
di "Mean age started (among those starting by age $xMax) = ", $7.1f $XB
drop SB_

* SBR3 = SB(x)*r3; SBR2 = SB(x)*r2; SBR1 = SB(x)*r1
qui gen SBR1 = .
qui gen SBR2 = .
qui gen SBR3 = .
gen SC = .

prog def getSC
* $1 = T1; $2 = T2; $3 = T3; $4 = r1; $5 = r2; $6 = r3
global T1 = $1
global T2 = $2
global T3 = $3
global r1 = $4
global r2 = $5
global r3 = $6

```

produced by KJRTC

# HUMPHREY

nir6\_r2\_r1.do

-----Wecker Change: replace 0.7 and 0.9 with 1.0-----

```
getSC 1954 1963 2001 0.9 0.7 1.0
getSC 1954 1963 2001 1.0 1.0 1.0
```

-----End Wecker Change-----

```
qui gen FC = 1 - SC
lab var FC - FC (no post-2000 Misconduct) mid est.
getSC 1954 1963 2001 0.9 0.7 0.7
```

```
qui gen FC7 = 1 - SC
```

```
lab var FC7 - FC (post-2000 Misconduct) mid est.
```

```
getSC 1954 1963 2001 0.9 0.6 1.0
```

```
getSC 1954 1963 2001 0.8 0.8 1.0
```

```
getSC 1954 1963 2001 0.8 0.7 1.0
```

```
getSC 1954 1963 2001 0.8 0.6 1.0
```

```
qui gen FC_hi = 1 - SC
```

```
lab var FC_hi - FC (no post-2000 Misconduct) high est.
```

```
getSC 1954 1963 2001 0.8 0.6 0.6
```

```
qui gen FC7hi = 1 - SC
```

```
lab var FC7hi - FC (post-2000 Misconduct) high est.
```

end

-----

```
qui gen FB = 1 - SB
```

```
graph results for T1,T2 = 1954,1963 r1,r2 = 0.9,0.6 vs. T2 = 1988, r2 = 0.6
or FC - FB x/lab(0.25, .5, .75, 1) xlab(10,20,30,40,50) s(iii)c(JJJ)l1("Cumulative Proport
```

```
ion Who Have Begun to Smoke")saving(nir6a,replace)
```

```
or FC - FC7 - FB x/lab(0.25, .5, .75, 1) xlab(10,20,30,40,50) s(iii)c(JJJ)l1("Cumulative Proport
```

```
ion Who Have Begun to Smoke")saving(nir6b,replace)
```

```
keep x F.
```

```
format %6.0f
```

```
format %6.0f
```

```
save nir6_r2_r1, replace
```

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```

Produced by RJRTC  
in  
HUMPHREY

52614 0880

01

use 'nir', clear

```
* (1) Save distribution of yrborn in matrix t
* Exclude observations for which yrborn was imputed
* drop if iBegin == 0
(1) observations deleted
```

```
* Exclude observations for which date of first exposure to asbestos unknown
* drop if Ylexp == .
(2) observations deleted
```

```
* qui tab yrborn (nw), matcell(pi) mroww(t_)
```

```
* matrix pi = pi\_result(1)
```

```
* matrix pi = r\_pi
```

```
* m = number of rows of pi
```

```
* col 1 (year t), col 2(pi(t))
```

```
* matrix colnames pi = t pi(t)
```

```
* global m = rowsof(pi)
```

```
* matrix drop t_
```

```
* Distribution of year of birth
```

```
* matrix list pi
```

```
pi[64,2]
```

```

t      pi(t)
11 1896 .00018528
12 1897 .00014319
13 1898 .00010316
14 1899 .00063647
15 1900 .00113331
16 1901 .0016957
17 1902 .00113415
18 1903 .00113415
19 1904 .00063443
20 1905 .00281819
21 1906 .0032298
22 1907 .00449854
23 1908 .00365987
24 1909 .00763218
25 1910 .00601509
26 1911 .00871055
27 1912 .00815244
28 1913 .0137759
29 1914 .01685662
30 1915 .01611598
31 1916 .01891755
32 1917 .02051612
33 1918 .02706036
34 1919 .02981462
35 1920 .02726175
36 1921 .03644682
37 1922 .03416953
38 1923 .03654592
39 1924 .03229662
40 1925 .04102194
41 1926 .03281913
42 1927 .0487059
43 1928 .04231479
44 1929 .02749656
```

```

r34 1930 .02990647
r35 1931 .02959857
r36 1932 .03061196
r37 1933 .0813038
r38 1934 .0601592
r39 1935 .0311329
r40 1936 .0441846
r41 1937 .02655839
r42 1938 .02412411
r43 1939 .02616626
r44 1940 .02094601
r45 1941 .01744799
r46 1942 .02677041
r47 1943 .01544061
r48 1944 .01626907
r49 1945 .01590855
r50 1946 .01662858
r51 1947 .0175302
r52 1948 .0221351
r53 1949 .0705061
r54 1950 .0061345
r55 1951 .00809841
r56 1952 .00559396
r57 1953 .00404073
r58 1954 .00267647
r59 1955 .0015045
r60 1956 .00106411
r61 1957 .00036056
r62 1958 .00045207
r63 1959 .0008493
r64 1965 .00045207
```

```

* Tabulate year first exposed to asbestos
* tab Ylexp (nw), missing
(frequency weights assumed)
```

Year 1st Exposed to Asbestos	Freq.	Percent	Cum.
1912	986	0.00	0.00
1916	290	0.00	0.00
1920	40840	0.14	0.14
1921	3110	0.01	0.15
1922	19609	0.07	0.22
1923	56285	0.19	0.41
1924	8718	0.03	0.44
1925	36357	0.12	0.56
1926	23378	0.08	0.64
1927	19837	0.07	0.70
1928	42169	0.14	0.84
1929	39256	0.13	0.98
1930	34287	0.12	1.09
1931	57118	0.19	1.28
1932	34116	0.11	1.40
1933	101397	0.34	1.74
1934	109712	0.37	2.11
1935	198040	0.66	2.77
1936	271812	0.91	3.68
1937	323316	1.09	4.77
1938	264281	0.89	5.66
1939	421068	1.41	7.07
1940	999414	3.35	10.42
1941	1236684	4.15	14.57

1942	1281368	4.31	18.88
1943	1198482	4.02	22.90
1944	702165	2.36	25.26
1945	1011878	3.40	28.65
1946	1189366	3.99	32.04
1947	976726	3.28	35.42
1948	1080973	3.63	38.80
1949	508863	2.04	41.59
1950	889106	2.98	44.58
1951	1196194	4.01	48.59
1952	1257312	4.22	52.81
1953	978193	3.28	56.09
1954	506674	1.68	57.77
1955	920743	3.09	60.86
1956	661422	2.22	63.08
1957	680420	2.28	65.37
1958	822919	2.76	68.13
1959	801776	2.69	70.82
1960	617267	2.07	72.89
1961	437519	1.47	74.36
1962	668148	2.24	76.60
1963	605962	2.03	78.63
1964	928567	3.12	81.75
1965	1013328	3.40	85.15
1966	879274	2.95	88.10
1967	582736	1.82	89.92
1968	634357	2.13	92.05
1969	524800	1.76	93.81
1970	460072	1.54	95.36
1971	294009	0.99	96.34
1972	311490	1.11	97.46
1973	275410	0.93	98.38
1974	227840	0.76	99.15
1975	68952	0.23	99.38
1976	16228	0.12	99.50
1977	29142	0.10	99.60
1978	5640	0.02	99.62
1979	45593	0.15	99.77
1980	30175	0.10	99.87
1985	13471	0.05	99.92
1988	25308	0.08	100.00
Total	29798568	100.00	

```
qui gen byte smk_exp = yrBegin < Y1exp
```

```
lab var smk_exp "Began smoking before 1st employment with asbestos"
```

```
tab smk_exp [w=w]
(frequency weights assumed)
```

Began smoking before 1st employment with asbestos	Freq.	Percent	Cum.
0	15219351	51.07	51.07
1	14579217	48.93	100.00
Total	29798568	100.00	

```
Set up duration variable for initiation analysis
```

```

gen int ageEnd = ageBegin
(601 missing values generated)

replace ageEnd = yrBorn if yrBorn = ageEnd
(11 changes made)

replace ageEnd = yrBorn if ageEnd ==
(524 real changes made)

replace ageEnd = yrRecv - yrBorn if ageEnd ==
(77 real changes made)

gen byte smoked = Smoker == 1

* (3) Compute initiation survival curve
start ageEnd(w) = failure(Smoker) origin((time 0) scale(1)) id(poc)
change weight = 1 / (1 - failure(Smoker))

obs. time interval: (ageEnd[n-1], ageEnd]
exit on or before: failure
weight: (fweight=w)

```

```
3881 total obs.
0 exclusions
```

```
3881 physical obs. remaining, equal to
2.98e-07 weighted obs., representing
2.98e-07 subjects
```

```

2.28e-07 failures in single failure-per-subject data
9.49e-08 total analysis time at risk, at risk from t = 0
earliest observed entry t = 0
last observed exit t = 95

```

```
sts generate SB = s
```

```
form SB $9.3f
```

```
gen byte x = _t
```

```
lab var x "Age"
```

```
gen FB = 1 - SB
```

```
form FB $9.3f
```

```
lab var FB "Cumul prop started smoking (BL)"
```

```
sort x
```

```
drop if x == x[_n-1]
(3796 observations deleted)
```

```
global N = _N + 1
```

```
set obs SN
```

```
obs was 85, now 86
```

```
qui sum x
```

```
global xMin = r(min) - 1
```



```

* replace x = $xMin in $N
  (1 real change made)
* replace FB = 0. in $N
  (1 real change made)
* replace SB = 1. in $N
  (1 real change made)

```

```

sort x

```

```

form FB %9.0g

```

```

* $1: FB x if x<=50, xlab(10,15,20,25,30,35,40,45,50)ylab(0,.25,.5,.75,1)sc(0)
  > %saving(nir6a,replace)

```

```

form FB %9.3f

```

```

1 x FB if x<=50

```

x	FB
1.	0.000
2.	0.022
3.	0.010
4.	0.041
5.	0.057
6.	0.083
7.	0.114
8.	0.136
9.	0.260
10.	0.347
11.	0.409
12.	0.485
13.	0.514
14.	0.565
15.	0.586
16.	0.605
17.	0.624
18.	0.640
19.	0.654
20.	0.664
21.	0.671
22.	0.684
23.	0.691
24.	0.698
25.	0.705
26.	0.713
27.	0.720
28.	0.724
29.	0.727
30.	0.730
31.	0.732
32.	0.740
33.	0.743
34.	0.744
35.	0.746
36.	0.747
37.	0.750
38.	0.752
39.	0.754
40.	0.754
41.	0.755
42.	0.757

```

* (4) Computation of initiation rates in CF scenario
* Cutoff years for decrease in initiation rates are $T1 and max($T2,Y1exp)
* Relative decrease in initiation rate (on or after year T1) is Global variab
  le $r1
* Relative decrease in initiation rate (on or after max($T2,Y1exp)) is global
  variable $r2
* Relative decrease in initiation rate (on or after max($T3,Y1exp)) is global
  variable $r3

```

```

* SB(x) cumulative proportion not smoking through age x in BL scenario.

```

```

keep SB x Y1exp

```

```

order x SB

```

```

order x SB

```

```

* Global $xMin as cutoff for even smoking
  global $xMin
* drop if x > $xMax
  (44 observations deleted)

```

```

qui sum x

```

```

global $xMin = r(min)

```

```

global N = _N

```

```

* Lifetime probability of not smoking by age $xMax in BL scenario

```

```

global PB = SB($N)

```

```

* Conditional survival curve in BL scenario

```

```

qui gen SB_ = 1 - (1 - SB)/(1 - $PB)

```

```

qui sum SB_

```

```

* Mean age started among those starting by age $xMax in BL scenario

```

```

global XB = $xMin + r(mean)*$N

```

```

di "Probability of not smoking (by age $xMax) = ".XB/$N

```

```

Probability of not smoking (by age 50) = 0.243

```

```

di "Mean age started (among those starting by age $xMax) = ".XB

```

```

Mean age started (among those starting by age 50) = 20.7

```

```

drop SB_

```

```

* SBR3 = SB(x)^r3; SBR2 = SB(x)^r2; SBR1 = SB(x)^r1

```

```

qui gen SBR1 = .

```

```

qui gen SBR2 = .

```

```

qui gen SBR3 = .

```

```

gen SC = .

```

```

(42 missing values generated)

```

```

prog def getSC

```

```

1. * $_1 = T1; $_2 = T2; $_3 = T3; $_4 = r1; $_5 = r2; $_6 = r3

```

```

10. else {
11.     if (a3 == 0 & a2 == 1)
12.         di = "C";
13.     based: 'ul' = & 'ul' <= a3; 0
14.     DEROGING
15.     cui zeolara SC = SC + "n" + CS-2 in 1/100.

```

<http://legacy.library.ucsf.edu/stid/sg07a00/pdf> [www.industrydocuments.ucsf.edu/docs/ffgl0001](http://www.industrydocuments.ucsf.edu/docs/ffgl0001)



nir6.log

```
2. di Post-2000 0000 High-
3. di Misconduct Est. Middle Est.
4. di - Yes -, $12.3f FB(SN) - FC7(SN), $12.3f FB(
   SN) - FC7hi(SN)
5. di - No -, $12.3f FB(SN) - FC_
   SN) - FC_hi(SN)
6. end
```

```
Results
---
Post-2000 Decrease in proportion smoked
Misconduct Low Middle High
Est. Est. Est.
Yes 0.018 0.036 0.057
No 0.017 0.000 0.056
```

log close

produced by RJRTC  
in  
HUMPHREY

nqr7\_R2\_R1.do

```

* @RM500
* nqr7: BL-CF differences in mean smoke-years exposure
* based upon empirical smoke-survival curve and mortality
* of claimants in HRA audit files (excluding Insulator crossovers)
* Relative risk quitting model hc(t) = r1*B1 + r2*B2 + r3*B3
* hc(t) = R2*HB(t) if T3 > year >= T2, where T2 > T1
* hc(t) = R3*HB(t) if year >= T3, where T3 > T2
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)
* Projection to future claimants based upon birth-year distribution pi()
* derived from age9.dta and distribution of ever-smokers by birth cohort
* from nlr.dta

clear
prog drop_all
set matsize 400
set rmsy off
set more off

lwd using nqr7. replace

* Cutoff years for changes in quit rates are global variables ST1, ST2, ST3
* Relative increase in quit rate (on or after year T1) is global variable SR1
* Relative increase in quit rate (on or after year T2) is global variable SR2
* Relative increase in quit rate (on or after year T3) is global variable SR3
* (R3 can be any value, not just 1; T3 can be any value, not just 1999)

* (1a) get distribution of birth year of all future claimants from age9.dta
use "age9"
keep year AllFutur
matat year AllFutur
matrix pi = year.AllFutur
* n = number of rows of pi
* col 1 (year t), col 2 (pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix list pi
drop_all

* (1b) Compute ever-smoking prevalence by birth cohort from nlr.dta
* Note: "nir.dta" excludes Insulator crossovers
drop_all
use "nir"
keep coh Smok w
tab coh [wew], sum(Smok)

* Matrix E holds ever-smoking prevalence by cohort
matrix E = (1980, 1989 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971)
matrix E = E, J(5,1,0)
matrix colnames E = t0 t1 Ever

prog def setE
    local i = 1
    while 'i' <= 5 (
        qui sum Smok [wew] if coh == 'i'
        matrix E["i",3] = r(mean)
        local i = 'i' + 1
    )
end
setE
matrix li i

* (1c) Compute conditional distribn of birth year pi() among ever smokers

```

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```

LSC 1954 1963 2001 1.0 2.1 1.0
qui gen SC_lo = SC
lab var SC_lo SC (R=1 post-2000) low est.
LSC 1954 1963 2001 0.1 0.2 2.1
LSC 1954 1963 2001 0.1 0.2 1.1
LSC 1954 1963 2001 1.0 2.1 1.0
LSC 1954 1963 2001 0.1 0.2 1.1
LSC 1954 1963 2001 1.0 2.1 1.0
LSC 1954 1963 2001 0.1 0.2 1.1
LSC 1954 1963 2001 1.0 2.1 1.0
LSC 1954 1963 2001 1.5 2.4 1.0
*****Wecker Change: change 3.0 and 1.5 to 1.0*****
LSC 1954 1963 2001 1.5 3.0 1.0
LSC 1954 1963 2001 1.0 1.0 1.0
*****End Wecker Change*****
qui gen SC = SC
lab var SC SC (R=1 post-2000) middle est.
LSC 1954 1963 2001 1.5 3.6 1.0
LSC 1954 1963 2001 2.0 2.4 1.0
LSC 1954 1963 2001 2.0 3.0 1.0
LSC 1954 1963 2001 2.0 3.6 1.0
LSC 1954 1963 2001 2.0 3.9 1.0
qui gen SC_Hi = SC
lab var SC_Hi SC (R=1 post-2000) high est.
LSC 1954 1963 2001 2.0 3.9 3.9
LSC 1954 1963 2001 1.5 3.0 1.0
LSC 1954 1963 2001 1.5 3.0 1.0
end
range SC
qr SC_LSB x if x<=75.ylab(0..25..5..75.1) xlab(20,30,40,50,60,70) s(ii)c(ij) l1("Proportion
Still Alive and Smoking") saving(nqr/a, replace)
qr SC_SC3 LSB x if x<=75.ylab(0..25..5..75.1) xlab(20,30,40,50,60,70) s(iii)c(iij) l1("Prop
ortion Still Alive and Smoking") saving(nqr/b, replace)
form LSB SC= 17.3f
form x 16.0f
keep x LSB SC_
1, nod
save nqr7_R2_R1, replace
log close
\032

```

Global EC =  $r(\text{mean})^{\text{SN}}$   
 di  $\$7.0f$   $\$71.1f$   $\$7.0f$   $\$72.1f$   $\$7.0f$   $\$73.1f$   $\$7.0f$   $\$74.1f$   $\$7.0f$   $\$75.1f$   $\$7.0f$   $\$76.1f$   $\$7.0f$   $\$77.1f$   $\$7.0f$   $\$78.1f$   $\$7.0f$   $\$79.1f$   $\$7.0f$   $\$80.1f$   $\$7.0f$   $\$81.1f$   $\$7.0f$   $\$82.1f$   $\$7.0f$   $\$83.1f$   $\$7.0f$   $\$84.1f$   $\$7.0f$   $\$85.1f$   $\$7.0f$   $\$86.1f$   $\$7.0f$   $\$87.1f$   $\$7.0f$   $\$88.1f$   $\$7.0f$   $\$89.1f$   $\$7.0f$   $\$90.1f$   $\$7.0f$   $\$91.1f$   $\$7.0f$   $\$92.1f$   $\$7.0f$   $\$93.1f$   $\$7.0f$   $\$94.1f$   $\$7.0f$   $\$95.1f$   $\$7.0f$   $\$96.1f$   $\$7.0f$   $\$97.1f$   $\$7.0f$   $\$98.1f$   $\$7.0f$   $\$99.1f$   $\$7.0f$   $\$100.1f$   $\$7.0f$   $\$101.1f$   $\$7.0f$   $\$102.1f$   $\$7.0f$   $\$103.1f$   $\$7.0f$   $\$104.1f$   $\$7.0f$   $\$105.1f$   $\$7.0f$   $\$106.1f$   $\$7.0f$   $\$107.1f$   $\$7.0f$   $\$108.1f$   $\$7.0f$   $\$109.1f$   $\$7.0f$   $\$110.1f$   $\$7.0f$   $\$111.1f$   $\$7.0f$   $\$112.1f$   $\$7.0f$   $\$113.1f$   $\$7.0f$   $\$114.1f$   $\$7.0f$   $\$115.1f$   $\$7.0f$   $\$116.1f$   $\$7.0f$   $\$117.1f$   $\$7.0f$   $\$118.1f$   $\$7.0f$   $\$119.1f$   $\$7.0f$   $\$120.1f$   $\$7.0f$   $\$121.1f$   $\$7.0f$   $\$122.1f$   $\$7.0f$   $\$123.1f$   $\$7.0f$   $\$124.1f$   $\$7.0f$   $\$125.1f$   $\$7.0f$   $\$126.1f$   $\$7.0f$   $\$127.1f$   $\$7.0f$   $\$128.1f$   $\$7.0f$   $\$129.1f$   $\$7.0f$   $\$130.1f$   $\$7.0f$   $\$131.1f$   $\$7.0f$   $\$132.1f$   $\$7.0f$   $\$133.1f$   $\$7.0f$   $\$134.1f$   $\$7.0f$   $\$135.1f$   $\$7.0f$   $\$136.1f$   $\$7.0f$   $\$137.1f$   $\$7.0f$   $\$138.1f$   $\$7.0f$   $\$139.1f$   $\$7.0f$   $\$140.1f$   $\$7.0f$   $\$141.1f$   $\$7.0f$   $\$142.1f$   $\$7.0f$   $\$143.1f$   $\$7.0f$   $\$144.1f$   $\$7.0f$   $\$145.1f$   $\$7.0f$   $\$146.1f$   $\$7.0f$   $\$147.1f$   $\$7.0f$   $\$148.1f$   $\$7.0f$   $\$149.1f$   $\$7.0f$   $\$150.1f$   $\$7.0f$   $\$151.1f$   $\$7.0f$   $\$152.1f$   $\$7.0f$   $\$153.1f$   $\$7.0f$   $\$154.1f$   $\$7.0f$   $\$155.1f$   $\$7.0f$   $\$156.1f$   $\$7.0f$   $\$157.1f$   $\$7.0f$   $\$158.1f$   $\$7.0f$   $\$159.1f$   $\$7.0f$   $\$160.1f$   $\$7.0f$   $\$161.1f$   $\$7.0f$   $\$162.1f$   $\$7.0f$   $\$163.1f$   $\$7.0f$   $\$164.1f$   $\$7.0f$   $\$165.1f$   $\$7.0f$   $\$166.1f$   $\$7.0f$   $\$167.1f$   $\$7.0f$   $\$168.1f$   $\$7.0f$   $\$169.1f$   $\$7.0f$   $\$170.1f$   $\$7.0f$   $\$171.1f$   $\$7.0f$   $\$172.1f$   $\$7.0f$   $\$173.1f$   $\$7.0f$   $\$174.1f$   $\$7.0f$   $\$175.1f$   $\$7.0f$   $\$176.1f$   $\$7.0f$   $\$177.1f$   $\$7.0f$   $\$178.1f$   $\$7.0f$   $\$179.1f$   $\$7.0f$   $\$180.1f$   $\$7.0f$   $\$181.1f$   $\$7.0f$   $\$182.1f$   $\$7.0f$   $\$183.1f$   $\$7.0f$   $\$184.1f$   $\$7.0f$   $\$185.1f$   $\$7.0f$   $\$186.1f$   $\$7.0f$   $\$187.1f$   $\$7.0f$   $\$188.1f$   $\$7.0f$   $\$189.1f$   $\$7.0f$   $\$190.1f$   $\$7.0f$   $\$191.1f$   $\$7.0f$   $\$192.1f$   $\$7.0f$   $\$193.1f$   $\$7.0f$   $\$194.1f$   $\$7.0f$   $\$195.1f$   $\$7.0f$   $\$196.1f$   $\$7.0f$   $\$197.1f$   $\$7.0f$   $\$198.1f$   $\$7.0f$   $\$199.1f$   $\$7.0f$   $\$200.1f$   $\$7.0f$   $\$201.1f$   $\$7.0f$   $\$202.1f$   $\$7.0f$   $\$203.1f$   $\$7.0f$   $\$204.1f$   $\$7.0f$   $\$205.1f$   $\$7.0f$   $\$206.1f$   $\$7.0f$   $\$207.1f$   $\$7.0f$   $\$208.1f$   $\$7.0f$   $\$209.1f$   $\$7.0f$   $\$210.1f$   $\$7.0f$   $\$211.1f$   $\$7.0f$   $\$212.1f$   $\$7.0f$   $\$213.1f$   $\$7.0f$   $\$214.1f$   $\$7.0f$   $\$215.1f$   $\$7.0f$   $\$216.1f$   $\$7.0f$   $\$217.1f$   $\$7.0f$   $\$218.1f$   $\$7.0f$   $\$219.1f$   $\$7.0f$   $\$220.1f$   $\$7.0f$   $\$221.1f$   $\$7.0f$   $\$222.1f$   $\$7.0f$   $\$223.1f$   $\$7.0f$   $\$224.1f$   $\$7.0f$   $\$225.1f$   $\$7.0f$   $\$226.1f$   $\$7.0f$   $\$227.1f$   $\$7.0f$   $\$228.1f$   $\$7.0f$   $\$229.1f$   $\$7.0f$   $\$230.1f$   $\$7.0f$   $\$231.1f$   $\$7.0f$   $\$232.1f$   $\$7.0f$   $\$233.1f$   $\$7.0f$   $\$234.1f$   $\$7.0f$   $\$235.1f$   $\$7.0f$   $\$236.1f$   $\$7.0f$   $\$237.1f$   $\$7.0f$   $\$238.1f$   $\$7.0f$   $\$239.1f$   $\$7.0f$   $\$240.1f$   $\$7.0f$   $\$241.$

	prog def	rangSC	P1	P2	P3	XB	XC	del $\alpha_X^*$
	$H_i \cdot$	T1	T1					

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```

* Cutoff years for changes in quit rates are global variables $T1, $T2, $T3
* Relative increase in quit rate (on or after Year $T1) is global variable $R1
* Relative increase in quit rate (on or after Year $T2) is global variable $R2
* Relative increase in quit rate (on or after Year $T3) is global variable $R3
* ($R3 can be any value, not just 1; if you want any value other than 1994,
  use "age9".

```

```

* (la) get distribution of birth year of all future claimants from age9.dta

```

```

use "age9".

```

```

keep year AllFutur

```

```

mkmat year AllFutur

```

```

matrix pi = year.AllFutur

```

```

matrix drop year AllFutur

```

```

* m = number of rows of pi

```

```

* Col 1 (year t), col 2(pi(t))

```

```

matrix colnames pi = t pi(t)

```

```

global m = rows(pi)

```

```

matrix list pi

```

```

pi[1..2]

```

```

1 1900 .00004113 pi(t)
2 1901 .00002101
3 1902 .00003102
4 1903 .00004538
5 1904 .00005578
6 1905 .00009443
7 1906 .00013421
8 1907 .00018888
9 1908 .00024279
10 1909 .00036178
11 1910 .00049251
12 1911 .00066282
13 1912 .00089162
14 1913 .00115474
15 1914 .00150459
16 1915 .00192976
17 1916 .00244442
18 1917 .00305756
19 1918 .00377616
20 1919 .00460425
21 1920 .00554198
22 1921 .00658479
23 1922 .00772278
24 1923 .00894043
25 1924 .01021674
26 1925 .01152602
27 1926 .01283937
28 1927 .01412696
29 1928 .01536111
30 1929 .01652004
31 1930 .01759233
32 1931 .01858097
33 1932 .01950742
34 1933 .02041352
35 1934 .02136119
36 1935 .02242851

```

```

r37 1936 .02370143
r38 1937 .02526133
r39 1938 .02716919
r40 1939 .02933884
r41 1940 .0318337
r42 1941 .03466946
r43 1942 .03783558
r44 1943 .04074331
r45 1944 .04321814
r46 1945 .04507414
r47 1946 .04608816
r48 1947 .04609812
r49 1948 .0450277
r50 1949 .04289862
r51 1950 .03982827
r52 1951 .03601309
r53 1952 .03170149
r54 1953 .02715816
r55 1954 .02263818
r56 1955 .01838311
r57 1956 .01453312
r58 1957 .01117046
r59 1958 .00837034
r60 1959 .00611137
r61 1960 .00435352
r62 1961 .00303046
r63 1962 .00206233
r64 1963 .00137566
r65 1964 .00090207
r66 1965 .00058381
r67 1966 .00037486
r68 1967 .0002404
r69 1968 .00015518
r70 1969 .00010166
r71 1970 .00006881
r72 1971 .00017831

```

```

drop _all

```

```

* (1b) Compute ever-smoking prevalence by birth cohort from nlr.dta

```

```

* Note: 'nlr.dta' excludes insulator crossovers

```

```

drop _all

```

```

use "nlr"

```

```

keep coh Smok w

```

```

tab coh [w*], sum(Smok)
(analytic weights assumed)

```

cohort	Summary of Smoked?			Obs.
	Mean	Std. Dev.	Freq.	
-1909	.65828276	.47546956	846463	201
1910-19	.78556302	.41063019	5166357	1032
1920-29	.79826907	.40141712	11307582	1609
1930-39	.75219631	.41200298	7859782	813
1940-	.7517905	.43243825	5989341	466
Total	.77181249	.41971504	31169725	4121

```

* Matrix E holds ever-smoking prevalence by cohort

```

```

matrix E = {1900, 1909 \ 1910, 1919 \ 1920, 1929 \ 1930, 1939 \ 1940, 1971 }
matrix E = E, J(5,1,0)
matrix colnames E = t0 t1 Ever

prog def setE
1. local i = 1
2. while 'i' <= 5 {
3.   qui sum Smok [row] if coh == 'i'
4.   matrix E["i",3] = r(mean)
5.   local i = 'i' + 1
6. }
7. end

setE
matrix li E

E(5,3)
t0      t1      Ever
1 1900 1909 65828276
2 1910 1919 78556302
3 1920 1929 79826907
4 1930 1939 75219631
5 1940 1971 7517905

* (1c) Compute conditional distribn of birth year pi() among ever smokers
drop _all;
format pi
Number of observations will be reset to 72
Press any key to continue, or Break to abort
this was 0, now 72

ren pi t
ren pi2 pi
qui gen pi_ =
toom pi* '9.41

prog def getpi
1. local i = 1
2. while 'i' <= 5 {
3.   replace pi_ = pi*E["i",3] if t >= 'i' & t <= E["i",2]
4.   Note: in CF with pre-1988 misconduct, ever-smoking prevalence
of 1940+ birth cohort will be reduced by 3.6%. (nir4.log).
But this feedback effect is very small.
5.   local i = 'i' + 1
6. }
7. qui sum pi_
8. global sumpi = r(mean)*r(N)
9. qui replace pi_ = pi_/sumpi
10. end

getpi
(10) real changes made)
(10) real changes made)
(10) real changes made)

(10 real changes made)
(32 real changes made)

matrix pi = pi(1..5m,1..1)
matrix pi = pi*pi_
matrix pi = pi*pi_

(2) Compute Mean Years Smoked Among Persons Who Ever Smoked
drop _all
format and store to output
drop _all

global xMin = r(min)
global N = _N

* LSB is proportion who are still smoking and alive
gen LSB = L*SB
qui sum LSB

* EB is mean smoke-years taking mortality into account
global EB = r(mean)*$N

di "Mean smoke-years (BL) = ", '9.2f SEB
Mean smoke-years (BL) = 45.43

* LBR3 = L(x)*SB(x)*R3; LBR2 = L(x)*SB(x)*R2; LBR1 = L(x)*SB(x)*R1
gen LBR1 =
(82 missing values generated)
gen LBR2 =
(82 missing values generated)
gen LBR3 =
(82 missing values generated)
gen SC =
(82 missing values generated)

prog def LSC
1. $1 = T1; $2 = T2; $3 = T3; $4 = R1; $5 = R2; $6 = R3
2. global T1 = $1
3. global T2 = $2
4. global T3 = $3
5. global R1 = $4
6. global R2 = $5
7. Check T3 > T2 > T1
if $T2 <= $T1 | $T3 <= $T2 {
8. di "Invalid ", '9.0f $T1,$T2,$T3
9. exit
10. }

```





nqr7.log

1954 1963 2000 1.5 3.0 1.0 45.43 32.48 12.95

```

gr SC_ LSB x if x=75.ylab(0.25..5..75) xlab(20.40.60.70) s(ttl)c(ttl)
+ (-Proportion Still Alive and Smoking) saving(nqr7b, replace)
(Note: file nqr7a.gph not found)

gr SC_ SC3 LSB x if x=75.ylab(0.25..5..75) xlab(20.40.60.70) s(ttl)c(ttl)
+ JJJJJJ(-Proportion Still Alive and Smoking) saving(nqr7b, replace)
(Note: file nqr7b.gph not found)

```

form x %4.0f

keep x LSB SC\_

1. read

1. read

x	LSB	SC_10	SC_	SC_hi
1.	17	1.000	1.000	1.000
2.	18	1.000	1.000	1.000
3.	19	0.999	0.998	0.998
4.	20	0.994	0.990	0.983
5.	21	0.990	0.984	0.972
6.	22	0.977	0.962	0.933
7.	23	0.973	0.956	0.922
8.	24	0.957	0.945	0.903
9.	25	0.953	0.937	0.890
10.	26	0.959	0.930	0.879
11.	27	0.954	0.922	0.865
12.	28	0.951	0.917	0.856
13.	29	0.946	0.908	0.841
14.	30	0.939	0.895	0.818
15.	31	0.934	0.886	0.803
16.	32	0.925	0.869	0.776
17.	33	0.922	0.863	0.765
18.	34	0.910	0.842	0.731
19.	35	0.900	0.823	0.900
20.	36	0.895	0.814	0.688
21.	37	0.891	0.806	0.675
22.	38	0.883	0.792	0.654
23.	39	0.873	0.773	0.625
24.	40	0.859	0.749	0.590
25.	41	0.852	0.736	0.571
26.	42	0.845	0.708	0.531
27.	43	0.822	0.685	0.500
28.	44	0.810	0.665	0.475
29.	45	0.791	0.634	0.435
30.	46	0.776	0.611	0.407
31.	47	0.760	0.587	0.379
32.	48	0.742	0.560	0.349
33.	49	0.730	0.544	0.332
34.	50	0.706	0.512	0.299
35.	51	0.695	0.499	0.287
36.	52	0.678	0.479	0.268
37.	53	0.659	0.457	0.250
38.	54	0.642	0.437	0.233
39.	55	0.618	0.413	0.214
40.	56	0.596	0.392	0.199
41.	57	0.573	0.370	0.184
42.	58	0.559	0.357	0.175
43.	59	0.536	0.338	0.163
44.	60	0.515	0.317	0.151

. save nqr7\_R2\_R1. replace  
(Note: file nqr7\_R2\_R1.dta not found)  
file nqr7\_R2\_R1.dta saved

. log close

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```

* nqr8_r2_r1.do
* nqr8: BL-CF differences in mean smoke-years exposure
* based upon empirical smoke-survival curve and mortality
* of claimants in HPA audit files
* hC(t) = R2-hB(t) if T3 > year >= T2, where T2 = 1999
* hC(t) = R3-hB(t) if year >= T3, where T3 = 2000
* (R) can be any value, not just 1; T3 can be any value, not just 1999
* Scenario pre-88 misconduct Estimate
* BL 1.0 1.0 1.0
* CF yes 1.0 2.1 1.0
* CF mid 1.5 3.0 1.0
* CF yes 2.0 3.9 1.0

* Input files: nqr, nqr4
clear
prog drop_all
set matsize A00
set msg off
set more off

log using nqrA, replace

* Cutoff years for changes in quit rates are global variables $T1, $T2, $T3
* Relative increase in quit rate (on or after year T1) is global variable $R1
* Relative increase in quit rate (on or after year T2) is global variable $R2
* Relative increase in quit rate (on or after year T3) is global variable $R3
* (R) can be any value, not just 1; T3 can be any value, not just 1999

* (1) Conditional distribn of birth year pi() among "past" ever smokers

use "nqr"
* Save distribution of yrborn in Matrix pi(t)
* qui tab yrborn [w=w], matcell(pi) matrow(t_)
matrix pi = pi_result(t)
matrix pi = t_ pi
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
matrix colnames pi = t pi(t)
global m = rowsof(pi)
matrix drop t_
matrix list pi

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked

drop_all
* Get L and SB from nqr4 output
use "nqr4"
* qui sum x
global xMin = r(min)
global N = "N"

* is proportion who are still smoking and alive
gen LSB = L*SB
* qui sum LSB
global EB = r(mean)*SN
* Mean smoke-years (BL) (BL) = "19.2f $EB
* LSBR3 = L(x)*SB(x)*R3; LSBR2 = L(x)*SB(x)*R2; LSBR1 = L(x)*SB(x)*R1
* gen LSBR1 =
* gen LSBR2 =
* gen LSBR3 =
* gen SC =

prog def LSC
* $1 = T1; $2 = T2; $3 = T3; $4 = R1; $5 = R2; $6 = R3
global T1 = $1
global T2 = $2
global T3 = $3
global A1 = $4
global A2 = $5
global A3 = $6
* Check T3 > T2 > T1
* if $T2 <= $T1 | $T3 <= $T2 (
di "Invalid: .09.0f $T1,$T2,$T3
exit
* Compute SB(x)*R1 and L(x)*SB(x)*R1
* Compute SB(x)*R2 and L(x)*SB(x)*R2
* Compute SB(x)*R3 and L(x)*SB(x)*R3
* qui replace LSBR1 = L*SB*$R1
* qui replace LSBR2 = L*SB*$R2
* qui replace LSBR3 = L*SB*$R3
* Compute SC = sum over index 'i' (rows of pi)
* Sum over index 'i' (rows of pi)
local i = 1
while 'i' <= $m (
local t = pi['i',1]
* 't' year of birth
local u1 = $T1 - 't' - $XMin - 1
local v1 = 'u1' + 1
local u2 = $T2 - 't' - $XMin - 1
local v2 = 'u2' + 1
local u3 = min($T3 - 't' - $XMin - 1,$N)
local v3 = 'u3' + 1
* Compute intermediate 'areas'
local A1 = SB['u1']*(1-$R1)
local A2 = SB['u2']*(1-$R2)
local A3 = SB['u3']*(1-$R3)
* 'u3' > 'u2' > 'u1' required
* Case A:
if 'u3' <= 0 (
* qui replace SC = SC + pi['i',2] * LSBR3 * 'A3' in 'v3'/$N
)
else (
* Case B:
if 'u3' > 0 & 'u2' <= 0 (
* qui replace SC = SC + pi['i',2] * LSBR2 in 1/'u3'
if 'v3' <= $N (
* qui replace SC = SC + pi['i',2] * LSBR3 * 'A3' in 'v3'/$N
)
)
else (
* Case C:
if 'u2' > 0 & 'u1' <= 0 (
* qui replace SC = SC + pi['i',2] * LSBR1 in 1/'u2'
* qui replace SC = SC + pi['i',2] * LSBR2 * 'A2' in 'v2'/'u3'
if 'v3' <= $N (
* qui replace SC = SC + pi['i',2] * LSBR3 * 'A3' in 'v3'/$N
)
)
else (
* Case D:
* qui replace SC = SC + pi['i',2] * LSB in 1/'u1'
* qui replace SC = SC + pi['i',2] * LSBR1 * 'A1' in 'v1'/'u2'
* qui replace SC = SC + pi['i',2] * LSBR2 * 'A2' in 'v2'/'u3'
if 'v3' <= $N (
)
)
)
)
)

```

nqr8\_R2\_R1.do

1. nod  
save nqr8\_R2\_R1. replace

qui replace SC = SC + pi('i',2) \* LSR3 \* 'A1' \* 'A2' \* 'A3' in 'v3'/SN

produced by RJRTC

qui sum SC  
global EC = rimean('CN  
di 47.0f ST1.47.0f ST2.47.0f ST3.48.1f SR1.48.1f SR2.48.1f SR3.48.2f SEC.48.2f  
21 SEC - SEC  
end

prog del rangesC

di - T1 T2 T3 R1 R2 R3 XB XC deltax"

LSC 1954 1963 2001 1.0 2.1 1.0  
qui gen SC\_lo = SC  
lab var SC\_lo - SC (R=1 post-2000) low est."  
LSC 1954 1963 2001 1.0 2.1 2.1  
LSC 1954 1963 2001 1.0 2.4 1.0  
LSC 1954 1963 2001 1.0 3.0 1.0  
LSC 1954 1963 2001 1.0 3.6 1.0  
LSC 1954 1963 2001 1.5 2.4 1.0

\*\*\*\*\*Necker Change: change 3.0 and 1.5 to 1.0\*\*\*\*\*

LSC 1954 1963 2001 1.5 3.0 1.0  
LSC 1954 1963 2001 1.0 1.0 1.0

\*\*\*\*\*End Necker Change\*\*\*\*\*

qui gen SC\_hi = SC  
lab var SC\_hi - SC (R=1 post-2000) middle est."  
LSC 1954 1963 2001 1.5 3.0 3.0  
qui gen SC3 = SC  
lab var SC3 - SC (R=1 post-2000) middle est."

LSC 1954 1963 2001 1.5 3.0 3.0  
LSC 1954 1963 2001 2.0 2.4 1.0  
LSC 1954 1963 2001 2.0 3.0 1.0  
LSC 1954 1963 2001 2.0 3.6 1.0  
LSC 1954 1963 2001 2.0 3.9 1.0  
qui gen SC\_hi = SC  
lab var SC\_hi - SC (R=1 post-2000) high est."

LSC 1954 1963 2001 2.0 3.9 3.9  
LSC 1954 1963 1999 1.5 3.0 1.0  
LSC 1954 1963 1961 1951 1.5 3.0 1.0

pu

rangeSC

gr SC\_LSB x if x=75,ylab(20,30,40,50,60,70)(iii)c(JJJ11)('Proportio  
n Still Alive and Smoking')saving(nqr8a,replace)  
gr SC\_SC3 x if x=75,ylab(0,25,5,75,1)(xlab(20,30,40,50,60,70)(iii)c(JJJ11)('Pro  
portion Still Alive and Smoking')saving(nqr8b,replace)

form  
form x w  
keep x LST SC

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```

.gen SC =
(82 missing values generated)

* Cutoff years for changes in quit rates are global variables $T1, $T2, $T3
* Relative increase in quit rate (on or after year T1) is global variable $R1
* Relative increase in quit rate (on or after year T2) is global variable $R2
* Relative increase in quit rate (on or after year T3) is global variable $R3
* (R3 can be any value, not just 1; change and adjust statistics accordingly)

* (1) Conditional distribution of birth year pi() among 'past' ever smokers
use 'nqr'

* Save distribution of yrborn in Matrix pi(t)
qui tab yrborn [vew], matcell(pi) matrow(t_)

* matrix pi = pi_result(1)
* matrix pi = t_, pi
* m = number of rows of pi
* col 1 (year t), col 2(pi(t))
* matrix colnames pi = t pi(t)

* global m = rowsof(pi)
* matrix drop t,
* matrix list pi

* (2) Compute Mean Years Smoked Among Persons Who Ever Smoked
disp _all

* Get L and SB from nqr4 output
use 'nqr4'

* qui sum x

* global xMin = r(min)
* global N = _N

* LSB is proportion who are still smoking and alive
gen LSB = L*SB

* qui sum LSB

* EB is mean smoke-years taking mortality into account
* global EB = r(mean)*$N

* di "Mean smoke-years (BL) = ", $9.2f $EB
Mean smoke-years (BL) = 45.43

* LSBR1 = L(x)*SB(x)*R1; LSBR2 = L(x)*SB(x)*R2; LSBR3 = L(x)*SB(x)*R1
* gen LSBR1 =
(R2 missing values generated)

* gen LSBR2 =
(R2 missing values generated)

* gen LSBR3 =
(R2 missing values generated)

```



nqr8.log

28.	44	0.810	0.715	0.810	0.559
29.	45	0.791	0.682	0.791	0.513
30.	46	0.776	0.657	0.776	0.480
31.	47	0.760	0.631	0.760	0.445
32.	48	0.742	0.601	0.742	0.415
33.	49	0.730	0.582	0.730	0.385
34.	50	0.706	0.545	0.706	0.341
35.	51	0.695	0.529	0.695	0.323
36.	52	0.678	0.505	0.678	0.297
37.	53	0.659	0.478	0.659	0.270
38.	54	0.642	0.453	0.642	0.245
39.	55	0.618	0.422	0.618	0.216
40.	56	0.596	0.394	0.596	0.192
41.	57	0.573	0.366	0.573	0.168
42.	58	0.559	0.349	0.559	0.155
43.	59	0.536	0.324	0.536	0.137
44.	60	0.510	0.297	0.510	0.118
45.	61	0.492	0.279	0.492	0.107
46.	62	0.473	0.261	0.473	0.096
47.	63	0.448	0.238	0.448	0.083
48.	64	0.428	0.221	0.428	0.074
49.	65	0.411	0.207	0.411	0.067
50.	66	0.390	0.191	0.390	0.060
51.	67	0.374	0.179	0.374	0.055
52.	68	0.355	0.166	0.355	0.049
53.	69	0.335	0.152	0.335	0.044
54.	70	0.316	0.141	0.316	0.040
55.	71	0.299	0.130	0.299	0.036
56.	72	0.285	0.122	0.285	0.034
57.	73	0.273	0.116	0.273	0.032
58.	74	0.260	0.109	0.260	0.030
59.	75	0.250	0.104	0.250	0.028
60.	76	0.236	0.097	0.236	0.026
61.	77	0.222	0.091	0.222	0.024
62.	78	0.213	0.087	0.213	0.023
63.	79	0.203	0.080	0.203	0.022
64.	80	0.191	0.074	0.191	0.021
65.	81	0.176	0.068	0.176	0.019
66.	82	0.167	0.060	0.167	0.018
67.	83	0.161	0.059	0.161	0.017
68.	84	0.159	0.058	0.159	0.017
69.	85	0.158	0.058	0.158	0.017
70.	86	0.157	0.057	0.157	0.017
71.	87	0.149	0.060	0.149	0.016
72.	88	0.141	0.057	0.141	0.015
73.	89	0.127	0.051	0.127	0.014
74.	90	0.126	0.051	0.126	0.014
75.	91	0.126	0.051	0.126	0.014
76.	92	0.126	0.051	0.126	0.014
77.	93	0.126	0.051	0.126	0.014
78.	94	0.117	0.047	0.117	0.013
79.	95	0.117	0.047	0.117	0.013
80.	96	0.117	0.047	0.117	0.013
81.	97	0.117	0.047	0.117	0.013
82.	98	0.117	0.047	0.117	0.013

. save nqr8\_R2\_R1. replace  
 (Note: file nqr8\_R2\_R1.dta not found)  
 file nqr8\_R2\_R1.dta saved

asci close

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ndx4\_r2\_r1\_r1.do

```

* @MS00
* ndx4: Combines output of nqr8 (quit-rate effect) and nlr6 (initiation-rate) effect
* to estimate delta X (change in mean lifetime years of smoking) for past claimants
* Produces low, med, and high estimates of quit rates without post-2000 misconduct
clear
prog drop all
set matsize 500
set rmsg off
set more off

```

```

log using ndx4, replace
* Future claimants: Effects of decreased initiation
use nlr6_r2_r1
* Compute frequency distributions
prog def: Freq
  qui gen fs_1 = F2_1 - F2_2[_N-1]
end

```

```

freq B
freq C_lo
freq C_hi
drop F
drop in 1
form f: A7.31
form x: A6.01

```

```

* Combine with results on Past Claimants: Effect of Increase Quit Rates
merge x using nqr8_r2_r1
ren LSB SB
* Reverse sort order to compute conditional means
gen byte n = _N - _n
sort n
drop n

```

```

* Compute conditional means
prog def CondMean
  qui replace SS_1 = SS_1[_N-1] if f == 1
  qui gen ms_1 = sum(SS_1)
  qui replace ms_1 = ms_1 / SS_1
end

```

```

CondMean B
CondMean C_lo
CondMean C
CondMean C_hi
keep x f m
lsm m * A7.31
sort x
drop if f == 1

```

```

* Compute Mean Years Smoked (X)
prog def mX
  qui gen ss_1 = f_1 * ms_1
  qui sum ss_1
  global XS_1 = r(mean)
  drop ss_1
end

```

```

B xm
C_lo xm
C_hi xm

```

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\* Baseline scenario: Mean Years Smoked

```

di %9.1f $XB
prog def Results
  * -----
  * Description: In mean years smoked
  * Input: Low, med, and high estimates
  * Output: Est. of mean years smoked
  * No. of observations: 1000
  * If $XB = 1, then $XB = $XB - $XB
end
Results

```

```

* Convert results to matrix & save
matrix def dX = J(2,3,0)
matrix def dX = J(1,3,0)
matrix dX[1,1] = $XB - $XB_lo
matrix dX[1,2] = $XB - $XB
matrix dX[1,3] = $XB - $XB_hi
* Compute conditional means
gen byte scenario = 1
lab val scenario 1 "Post2000"
lab val scenario 2 "Post2000"
lab val scenario 3 "Post2000"
ren dX1 dX_lo
ren dX2 dX
ren dX3 dX_hi
gen byte Era = 1
lab def Era 1 "Past" 2 "Future"
lab val Era Era
order Era scenario dX_lo dX dX_hi
form dX %9.2f
save ndx4_r2_r1_r1, replace
1
log close
\032

```



```
* Future Claimsants: Effects of decreased initiation
```

```
use m176_r2_11
```

```
* Compute frequency distributions
```

```
prog def freq
```

```
1. qui gen ss_1 = F5_1 - F5_1[_n-1]
```

```
2. end
```

```
. freq B
```

```
. freq C_lo
```

```
. freq C_
```

```
. freq C_hi
```

```
. drop F*
```

```
. drop in 1
```

```
(1 observation deleted)
```

```
. form f * w7.3f
```

```
. form x *6.0t
```

```
* Combine with results on Past Claimsants: Effect of Increase Quit Rates
```

```
merge x using ngr8_r2_r1
```

```
. ren LSB SB
```

```
* Reverse sort order to compute conditional means
```

```
gen byte n = _N - _n
```

```
. sort n
```

```
. drop n
```

```
* Compute conditional means
```

```
prog def CondMean
```

```
1. qui replace ss_1 = SS_1[_n-1] if SS_1 ==
```

```
2. qui gen m5_1 = sum(SS_1)
```

```
3. qui replace m5_1 = m5_1/SS_1
```

```
4. end
```

```
. CondMean B
```

```
. CondMean C_lo
```

```
. CondMean C_
```

```
. CondMean C_hi
```

```
. keep x f* m*
```

```
. form m* *7.3f
```

```
. sort x
```

```
. drop x
```

```
(87 observations deleted)
```

produced by **PARTRC**

```
* Compute Mean Years Smoked (Y)
```

```
prog def mY
```

```
1. qui gen ss1 = F5_1 - m5_1
```

```
2. qui sum ss1
```

```
3. qui gen mY = ss1/_N
```

```
4. drop ss1
```

```
5. end
```

in

```
. mY C_
```

HUMPHREY

```
* Baseline Scenario: Mean Years Smoked
```

```
32.2
```

```
prog def Results
```

```
1. di "---- Decrease in mean years smoked ----"
```

```
2. di "Post-2000 Low Middle High"
```

```
3. di "Misconduct Est. Est. Est."
```

```
4. di "No ", %12.1f $XB - $XC_lo, %12.1f $XB - $XC_ , %12.1f $XB - $XC_hi
```

```
5. end
```

```
. Results
```

```
---- Decrease in mean years smoked ----
```

```
Post-2000 Low Middle High
```

```
Misconduct Est. Est. Est.
```

```
No 6.9 0.0 13.3
```

```
* Convert results to matrix & save
```

```
* matrix def dX = J(2,3,0)
```

```
* matrix def dX = J(1,3,0)
```

```
* matrix dX[1,1] = $XB - $XC_lo
```

```
* matrix dX[1,2] = $XB - $XC_
```

```
* matrix dX[1,3] = $XB - $XC_hi
```

```
. drop _all
```

```
. smat dX
```

```
number of observations will be reset to 1
```

```
Press any key to continue, or Break to abort
```

```
obs was 0, now 1
```

```
. gen byte Scenario = _n
```

```
. lab def Scenario 1*No-Post2000* 2*Post2000*
```

```
. lab val Scenario Scenario
```

```
. ren dX1 dX_lo
```

```
. ren dX2 dX
```

ndx4.log

```
ren dx3 dx_hi
gen byte Era = 1
lab def Era 1="Past" 2="Future"
lab val Era Era
order Era Scenario dx_lo dx dx_hi
form dx w9.2f
save ndx4_R2_r2_R1_r1, replace
(Note: file ndx4_R2_r2_R1_r1.dta not found)
file ndx4_R2_r2_R1_r1.dta saved
```

```
1. Era Scenario dx_lo
Past No. Post2000 6.86
log close
```

dx  
0.00

dx  
13.33

# produced by RJRTC in HUMPHREY

c.f. Horn's reduction in mean wctg's of 10.65

```

/* LIMDEP 7.0 source code:
Multivariate normal analysis of:
1. cumulative incidence of Lung Cancer (diedLC);
2. prevalence of parenchymal disease (by ILD profusion
score on X-ray) (Par);
3. abnormal pulmonary function by spirometry (PFT); and
4. determination of FVC (PFT); and
5. pleural injury (anyPleu)
This 'main' version assumes that there is no relationship between
smoking and pleural injury.
Exposure results based upon assumption of no misconduct post-2000.
*/

/* Restrict analysis to main sample (2,243) rather than
extended sample (2,609) */
reject: new: w = 0 $
skip

/* RHS variables (including years smoked, age categories, and
categories of post-latency asbestos exposure as 'X'.
namelist: X = one, smokYrs, ageG*, T10_* $

/* Separate namelist with years smoked dropped for pleural disease
dose-response models only */
namelist: XO = one, ageG*, T10_* $

/* Descriptive statistics (sample means) of RHS variables */
dstat: rhs = X $

/* Save sample mean values of X's (and constant) in X_BL,
which corresponds to baseline scenario (BL) */
matrix: Xmeans = part(LastData, 1, 7, 1, 1) $
/* Append 1 to vector of sample means */
matrix: u = (1) $
matrix: X_BL = [u / Xmeans] $

/* Construct conformal vector for Xo_BL */
dstat: rhs = XO $
matrix: Xmeans = part(LastData, 1, 6, 1, 1) $
matrix: Xo_BL = [u / Xmeans] $

/* Univariate models: Show marginal effects.
Note: LIMDEP computes partial derivatives dF/dxi, while
Stata by default shows discrete effects dF/dxi/delta xi.
*/
probit: lhs = diedLC: rhs = X: marginal effects $
matrix: b_LC = B $

probit: lhs = Par: rhs = X: marginal effects $
matrix: b_Par = B $

probit: lhs = PFT: rhs = X: marginal effects $
matrix: b_PFT = B $

/* Note change in RHS for anyPleu */
probit: lhs = anyPleu: rhs = XO: marginal effects $
matrix: b_Ple = B $

/* Pairwise Bivariate probit models */
bivariate: lhs = diedLC, Par: rhs = X: rh2 = X;
start = b_LC, b_Par: marginal effects $
matrix: b_LC_Par = part(B, 1, 8) $
calc: rhoLCPPar = rho $

bivariate: lhs = Par, PFT: rhs = X: rh2 = X;
start = b_Par, b_PFT: marginal effects $
calc: rhoLCPFT = rho $

matrix: b_Par_PFT = part(B, 1, 9, 16) $
calc: rhoParPFT = rho $

bivariate: lhs = diedLC, PFT: rhs = X: rh2 = X;
start = b_LC, b_PFT: marginal effects $
calc: rhoLCPFT = rho $

bivariate: lhs = PFT, anyPleu: rhs = X: rh2 = X;
start = b_PFT, b_Ple: marginal effects $
calc: rhoPFTPl = rho $

/* 4x4 Variance-covariance matrix for multivariate
normal calculations */
matrix: Omega4 = [1 /
rhoLCPPar, 1 /
rhoLCPFT, rhoParPFT, 1 /
rhoLCPle, rhoParPl, rhoPFTPl, 1] $

/* 3x3 Variance-covariance submatrix for multivariate
normal calculations */
matrix: Omega3 = part(Omega4, 1, 3, 1, 3) $

/* Computation of indices XB at (baseline) means of X
from probit models */
matrix: y_LC = X_BL'b_LC $
matrix: y_Par = X_BL'b_Par $
matrix: y_PFT = X_BL'b_PFT $
/* Note change in code for pleural */
matrix: y_Ple = Xo_BL'b_Ple $

/* Counterfactual values of indices (past) - no post-2000 misconduct */
matrix: y_LC_Phi = y_LC - 0*part(b_LC, 2, 2, 1, 1) $
matrix: y_LC_Phi = y_LC - 0*part(b_LC, 2, 2, 1, 1) $
matrix: y_LC_Plo = y_LC - 0*part(b_LC, 2, 2, 1, 1) $
matrix: y_Pa_P = y_Par - 0*part(b_Par, 2, 2, 1, 1) $
matrix: y_Pa_Phi = y_Par - 0*part(b_Par, 2, 2, 1, 1) $
matrix: y_Pa_Plo = y_Par - 0*part(b_Par, 2, 2, 1, 1) $
matrix: y_PFT_P = y_PFT - 0*part(b_PFT, 2, 2, 1, 1) $
matrix: y_PFT_Phi = y_PFT - 0*part(b_PFT, 2, 2, 1, 1) $
matrix: y_PFT_Plo = y_PFT - 0*part(b_PFT, 2, 2, 1, 1) $

/* Note change in code for pleural disease */
matrix: y_Pl_P = y_Ple $
matrix: y_Pl_Phi = y_Ple $
matrix: y_Pl_Plo = y_Ple $

/* Counterfactual values of indices (future) - no post-2000 misconduct */

```

[illegible]

Ms8a\_R2\_r2\_R1\_r1.1im

[illegible]

```

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_p] $
matrix: z1 = [y_Lc / y_Pa_p / y_PFT / y_PL_p] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_p = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_plo] $
matrix: z1 = [y_Lc / y_Pa_plo / y_PFT / y_PL_plo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_phi] $
matrix: z1 = [y_Lc / y_Pa_phi / y_PFT / y_PL_phi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_f] $
matrix: z1 = [y_Lc / y_Pa_f / y_PFT / y_PL_f] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_f = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_flo] $
matrix: z1 = [y_Lc / y_Pa_flo / y_PFT / y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_fhi] $
matrix: z1 = [y_Lc / y_Pa_fhi / y_PFT / y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1A = T*21 $
calc: p42_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_DBID $

/* Collect results and clean up. */
matrix: p42_p = p42_p $
matrix: p42_plo = p42_plo $
matrix: p42_phi = p42_phi $
matrix: p42_f = p42_f $
matrix: p42_flo = p42_flo $
matrix: p42_fhi = p42_fhi $
calc: delete p42_p, p42_plo, p42_phi $
calc: delete p42_f, p42_flo, p42_fhi $

/* Probability of NBID in BL */
matrix: T = [-1.0, 0 / 0.1, 0 / 0.0, -1] $
matrix: Omega3 = Part(Omega4, 1, 3, 1, 3) $
matrix: Omega3A = T*Omega3 $

matrix: z0 = [y_Lc / y_Par / y_PFT] $
matrix: zA = T*2 $
calc: p_NBID = Mvn(z0A, Omega3A) $

/* Probability of NBID in BL and NBID in CF */
matrix: z0 = [y_Lc / y_Pa_p / y_PFT] $
matrix: z0A = T*20 $
calc: p33_p = Mvn(z0A, Omega3A) / p_NBID $

matrix: z0 = [y_Lc / y_Pa_plo / y_PFT] $
matrix: z0A = T*20 $
calc: p33_plo = Mvn(z0A, Omega3A) / p_NBID $

matrix: z0 = [y_Lc / y_Pa_phi / y_PFT] $
matrix: z0A = T*20 $
calc: p33_phi = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_NBID $

matrix: z0 = [y_Lc / y_Pa_f / y_PFT] $
matrix: z0A = T*20 $
calc: p33_f = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_NBID $

matrix: z0 = [y_Lc / y_Pa_flo / y_PFT] $
matrix: z0A = T*20 $
calc: p33_flo = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_NBID $

matrix: z0 = [y_Lc / y_Pa_fhi / y_PFT] $
matrix: z0A = T*20 $
calc: p33_fhi = (Mvn(z0A, Omega3A) - Mvn(z1A, Omega3A)) / p_NBID $

/* Use Omega4 matrix */
matrix: T = [-1.0, 0, 0 / 0.1, 0, 0 / 0.0, -1, 0 / 0.0, 0, 1] $
matrix: Omega4A = T*Omega4 $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_p] $
matrix: z1 = [y_Lc / y_Pa_p / y_PFT / y_PL_p] $
matrix: z1A = T*21 $
calc: p43_p = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_plo] $
matrix: z0A = T*20 $
matrix: z1 = [y_Lc / y_Pa_plo / y_PFT / y_PL_plo] $
matrix: z1A = T*21 $
calc: p43_plo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_phi] $
matrix: z0A = T*20 $
matrix: z1 = [y_Lc / y_Pa_phi / y_PFT / y_PL_phi] $
matrix: z1A = T*21 $
calc: p43_phi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_f] $
matrix: z0A = T*20 $
matrix: z1 = [y_Lc / y_Pa_f / y_PFT / y_PL_f] $
matrix: z1A = T*21 $
calc: p43_f = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_flo] $
matrix: z0A = T*20 $
matrix: z1 = [y_Lc / y_Pa_flo / y_PFT / y_PL_flo] $
matrix: z1A = T*21 $
calc: p43_flo = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

matrix: z0 = [y_Lc / y_Par / y_PFT / y_PL_fhi] $
matrix: z0A = T*20 $
matrix: z1 = [y_Lc / y_Pa_fhi / y_PFT / y_PL_fhi] $
matrix: z1A = T*21 $
calc: p43_fhi = (Mvn(z0A, Omega4A) - Mvn(z1A, Omega4A)) / p_NBID $

```

produced by RJRTC  
in  
HUMPHREY

```

* @MS500
* DMS: Computation of present discounted value (PDV)
* of 'past' non-PDD resolved and unresolved claims.
* Input files: lv6: "Risk Free Interest Rate", ms7a
* This version is used ms7a as input files. Note that if ms7a is not present,
* Program modifies DMS3
* Program modifies DMS3
clear
prog drop _all
set rmsg off
set more off
set matsize 500

log using dm5_ms8a, replace

* (0) Liquidated value of unresolved claims (based on TDP)
* from [MatrixREV95.xls]Unresolved:
matrix U = (RM400, 35400, 51500, 12500)
matrix colnames U = LC NBID DBID PI
matrix rownames U = LiqVal

* Administrative costs per claim from [MatrixREV95.xls]Admin_costs
matrix C = (577, 210)
matrix rownames C = past unres
matrix colnames C = ad_cost
matrix li C

* (1) Compute discount factors
use "Risk Free Interest Rate"
* Drop 1989-1991 (Courts' Preliminary Orders cover only 1992-)
drop in 1-4
qui gen n = 2000 - _n
sort n
* Factor = 1 in 1
qui replace df = df[_n-1] * (1 + 1/100) in 2/9
form df %9.3f
sort y
drop n 1

* (2) Merge with lv6: incl. admin costs and unresolved claims
merge year using "lv6"
drop _m

* Estimated Liquidated Values of Unresolved Claims
qui replace VR_LC = U(1,1) if y == 2000
qui replace VS_LC = U(1,1) if y == 2000
qui replace VR_NBID = U(1,2) if y == 2000
qui replace VS_NBID = U(1,2) if y == 2000
qui replace VR_DBID = U(1,3) if y == 2000
qui replace VS_DBID = U(1,3) if y == 2000
qui replace VR_PI = U(1,4) if y == 2000
qui replace VS_PI = U(1,4) if y == 2000

* Add admin costs of past resolved claims to LiqVals
qui replace VR_LC = VR_LC + C(1,1) if y < 2000
qui replace VR_NBID = VR_NBID + C(1,1) if y < 2000
qui replace VR_DBID = VR_DBID + C(1,1) if y < 2000
qui replace VR_PI = VR_PI + C(1,1) if y < 2000
qui replace VS_LC = VS_LC + C(1,1) if y < 2000
qui replace VS_NBID = VS_NBID + C(1,1) if y < 2000
qui replace VS_DBID = VS_DBID + C(1,1) if y < 2000
qui replace VS_PI = VS_PI + C(1,1) if y < 2000

* Add admin costs to unresolved claims to LiqVals

```

```

qui replace VR_LC = VR_LC + C(2,1) if y == 2000
qui replace VR_NBID = VR_NBID + C(2,1) if y == 2000
qui replace VR_DBID = VR_DBID + C(2,1) if y == 2000
qui replace VR_PI = VR_PI + C(2,1) if y == 2000
qui replace VS_LC = VS_LC + C(2,1) if y == 2000
qui replace VS_NBID = VS_NBID + C(2,1) if y == 2000
qui replace VS_DBID = VS_DBID + C(2,1) if y == 2000
qui replace VS_PI = VS_PI + C(2,1) if y == 2000

* (3) Compute PDV of Liq Val + Admin Costs by Dx and Year
qui replace VR_LC = VR_LC * df
qui replace VR_NBID = VR_NBID * df
qui replace VR_DBID = VR_DBID * df
qui replace VR_PI = VR_PI * df
qui replace VS_LC = VS_LC * df
qui replace VS_NBID = VS_NBID * df
qui replace VS_DBID = VS_DBID * df
qui replace VS_PI = VS_PI * df

* (4) Convert to matrices (Note: Order needs to be conformal with
* order of rows in subdiagonal P-matrices in ms7a and ms7)
* RICO
qui replace YR_LC = 0 if YR_LC == .
qui replace YR_NBID = 0 if YR_NBID == .
qui replace YR_DBID = 0 if YR_DBID == .
qui replace YR_PI = 0 if YR_PI == .
mkmat YR_LC
mkmat YR_NBID
mkmat YR_DBID
mkmat YR_PI
matrix YR = YR_LC, YR_NBID, YR_DBID, YR_PI
matrix drop YR_LC YR_NBID YR_DBID YR_PI
matrix colnames YR = LC DBID NBID PI
matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YR, format(%8.0f) title("RICO Claims by Dx Year")

qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_PI = 0 if VR_PI == .
mkmat VR_LC
mkmat VR_NBID
mkmat VR_DBID
mkmat VR_PI
matrix VR = VR_LC, VR_DBID, VR_NBID, VR_PI
matrix drop VR_LC VR_NBID VR_DBID VR_PI
matrix colnames VR = LC DBID NBID PI
matrix rownames VR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li VR, format(%8.0f) title("RICO PDV LiqVal+AdminCost by Dx Year")

* SFA
qui replace VS_LC = 0 if VS_LC == .
qui replace VS_NBID = 0 if VS_NBID == .
qui replace VS_DBID = 0 if VS_DBID == .
qui replace VS_PI = 0 if VS_PI == .
mkmat VS_LC
mkmat VS_NBID
mkmat VS_DBID
mkmat VS_PI
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_PI
matrix drop VS_LC VS_NBID VS_DBID VS_PI
matrix colnames VS = LC DBID NBID PI
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000

```



```
matrix li VS, format('R,0f') title('SFA Claims by Dx Year')
```

```
qui replace VS_LC = 0 if VS_LC == .
qui replace VS_NBID = 0 if VS_NBID == .
qui replace VS_DBID = 0 if VS_DBID == .
qui replace VS_P1 = 0 if VS_P1 == .
mkmat VS_LC
mkmat VS_DBID
mkmat VS_NBID
mkmat VS_P1
```

```
matrix VS = VS_LC, VS_DBID, VS_NBID, VS_P1
matrix drop VS_LC VS_DBID VS_NBID VS_P1
```

```
matrix colnames VS = LC DBID NBID P1
```

```
matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
```

```
matrix li VS, format('R,0f') title('SFA PDV LiqVal+AdmCost by Dx Year')
```

```
• (4) Get P matrix from ms7a
```

```
• Note: This file has a slightly format than cr1 (as used in dms)
```

```
drop all
```

```
use ms8a_r2_r2_r1_r1
```

```
• Use only past estimates of P-matrix
```

```
keep if Era == 0
```

```
l.nod
```

```
• Loop through (low,med,high) (n = 1,2,3)
```

```
qui gen double PDV_RICO = .
```

```
qui gen double PDV_SFA = .
```

```
form PDV* %9.1f
```

```
matrix P = J(4,4,0)
```

```
prog def getPMV
```

```
global n = 1
```

```
while %n < 4
```

```
matrix P(1,1) = p11[5n]
```

```
matrix P(2,1) = p21[5n]
```

```
matrix P(3,1) = p31[5n]
```

```
matrix P(1,2) = p12[5n]
```

```
matrix P(2,2) = p22[5n]
```

```
matrix P(3,2) = p32[5n]
```

```
matrix P(1,3) = p13[5n]
```

```
matrix P(2,3) = p23[5n]
```

```
matrix P(3,3) = p33[5n]
```

```
matrix P(4,1) = p41[5n]
```

```
matrix P(4,2) = p42[5n]
```

```
matrix P(4,3) = p43[5n]
```

```
matrix P(4,4) = p44[5n]
```

```
di case: %n, %n
```

```
matrix li P
```

```
• Compute PDV for both RICO & SFA
```

```
matrix DR = trace(VR * (I(4) - P) * YR')
```

```
qui replace PDV_RICO = DR(1,1)/1e6 in %n
```

```
matrix DS = trace(VS * (I(4) - P) * YS')
```

```
qui replace PDV_SFA = DS(1,1)/1e6 in %n
```

```
• Save results in median case (n=2) for graphs and tables
```

```
if %n == 2
```

```
us
```

```
FR and FS are annual financial injury from RICO and SFA
```

```
matrix FR = P * YR'
```

```
matrix FS = P * YS'
```

```
matrix ZR = FR + FS'
```

```
matrix ZS = FR + FS'
```

```
matrix ZR = ZR'
```

```
matrix ZS = ZS'
```

```
• ZR and ZS are annual claims by DX in counterfactual scenario (median case)
```

```
matrix ZR = ZR'
```

```
matrix ZS = ZS'
```

```
•
```

```
global n = n + 1
```

```
end
```

end  
getPDV  
• Era Range PDV, S, PDV, S, nod  
• Display results for median case for graphs and tables  
• Final total injury by year  
svmat FR  
svmat FS  
• qui replace FR = FR/1e6  
• qui replace FS = FS/1e6  
• qui replace Year = \_n + 1991  
ren ZR1 ZR\_LC  
ren ZR2 ZR\_DBID  
ren ZR3 ZR\_NBID  
ren ZR4 ZR\_P1  
svmat ZS  
ren ZS1 ZS\_LC  
ren ZS2 ZS\_DBID  
ren ZS3 ZS\_NBID  
ren ZS4 ZS\_P1  
order y FR FS ZR\* ZS\*  
form p\* 2\* %9.0f  
l y F\*,nod  
l y Z\*,nod  
save Claims\_P.replace  
log close  
\032

```

* (10) Liquidated value of unresolved claims (based on TDP
* from (MatrixREV95.xls|Unresolved;
Matrix U = (88400, 25400, 51500, 12500)
Matrix colnames U = LC NBID DBID PI
Matrix rownames U = LiqVal

Matrix rownames C = past unres
Matrix colnames C = ad_cost
Matrix li C
C[2,1]
past 577
unres 210

* (1) Compute discount factors
use "Risk Free Interest Rate"

* Drop 1988-1991 (Courts' Preliminary Orders cover only 1992+)
drop in 1:4
(4 observations deleted)

qui gen n = 2000 - _n
sort n

gen dFactor = 1 in 1
(R missing values generated)

qui replace df = dF[_n-1]*(1 + 1/100) in 2/9

form df v9_3f

sort y
drop n 1

1
year dFactor
1. 1992 1.418
2. 1993 1.370
3. 1994 1.331
4. 1995 1.281
5. 1996 1.213
6. 1997 1.153
7. 1998 1.096
8. 1999 1.045
9. 2000 1.000

* (2) Merge with lv6; incl. admin costs and unresolved claims
merge year using "lv6"

```

drop \_m

qui replace VR\_NBID = U[1,2] if y == 2000

qui replace VS\_NBID = U[1,2] if y == 2000

qui replace VR\_DBID = U[1,3] if y == 2000

qui replace VS\_DBID = U[1,3] if y == 2000

qui replace VR\_PI = U[1,4] if y == 2000

qui replace VS\_PI = U[1,4] if y == 2000

\* Add admin costs of past resolved claims to LiqVals

qui replace VR\_LC = VR\_LC + C[1,1] if y < 2000

qui replace VR\_NBID = VR\_NBID + C[1,1] if y < 2000

qui replace VR\_DBID = VR\_DBID + C[1,1] if y < 2000

qui replace VR\_PI = VR\_PI + C[1,1] if y < 2000

qui replace VS\_LC = VS\_LC + C[1,1] if y < 2000

qui replace VS\_NBID = VS\_NBID + C[1,1] if y < 2000

qui replace VS\_DBID = VS\_DBID + C[1,1] if y < 2000

qui replace VS\_PI = VS\_PI + C[1,1] if y < 2000

\* Add admin costs to unresolved claims to LiqVals

qui replace VR\_LC = VR\_LC + C[2,1] if y == 2000

qui replace VR\_NBID = VR\_NBID + C[2,1] if y == 2000

qui replace VR\_DBID = VR\_DBID + C[2,1] if y == 2000

qui replace VR\_PI = VR\_PI + C[2,1] if y == 2000

qui replace VS\_LC = VS\_LC + C[2,1] if y == 2000

qui replace VS\_NBID = VS\_NBID + C[2,1] if y == 2000

qui replace VS\_DBID = VS\_DBID + C[2,1] if y == 2000

qui replace VS\_PI = VS\_PI + C[2,1] if y == 2000

\* (3) Compute PDV of Liq Val + Admin Costs by Dx and Year

qui replace VR\_LC = VR\_LC + df

qui replace VR\_NBID = VR\_NBID + df

qui replace VR\_DBID = VR\_DBID + df

```

qui replace VR_PL = VR_PL * dF
qui replace VS_LC = VS_LC * dF
qui replace VS_NBID = VS_NBID * dF
qui replace VS_DBID = VS_DBID * dF
qui replace VS_PL = VS_PL * dF
drop dF

* (J) Convert to matrices (Note: Order needs to be conformal with
* order of rows in subdiagonal P-matrices in ms7a and ms7)
* RICO
qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_PL = 0 if VR_PL == .
mkmat VR_LC
mkmat VR_NBID
mkmat VR_DBID
mkmat VR_PL

matrix YR = VR_LC, VR_DBID, VR_NBID, VR_PL
matrix drop YR_LC VR_NBID YR_DBID YR_PL
matrix colnames YR = LC DBID NBID PL
matrix rownames YR = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YR, format(%8.0f) title("RICO Claims by Dx Year")

VR(9,4): RICO Claims by Dx Year
LC DBID NBID PL
1992 0 0 0 0
1993 0 0 0 0
1994 0 0 0 0
1995 0 0 0 0
1996 460 18 50 41
1997 852 401 1165 1024
1998 1408 2386 3823 3811
1999 2265 16423 24116 8291
2000 2960 15359 24575 10674

qui replace VR_LC = 0 if VR_LC == .
qui replace VR_NBID = 0 if VR_NBID == .
qui replace VR_DBID = 0 if VR_DBID == .
qui replace VR_PL = 0 if VR_PL == .
mkmat VR_LC

* SFA
qui replace YS_LC = 0 if YS_LC == .
qui replace YS_NBID = 0 if YS_NBID == .
qui replace YS_DBID = 0 if YS_DBID == .
qui replace YS_PL = 0 if YS_PL == .
mkmat YS_LC
mkmat YS_NBID
mkmat YS_DBID
mkmat YS_PL

matrix YS = YS_LC, YS_DBID, YS_NBID, YS_PL
matrix drop YS_LC YS_NBID YS_DBID YS_PL
matrix colnames YS = LC DBID NBID PL
matrix rownames YS = 1992 1993 1994 1995 1996 1997 1998 1999 2000
matrix li YS, format(%8.0f) title("SFA Claims by Dx Year")

YS(9,4): SFA Claims by Dx Year
LC DBID NBID PL
1992 14 1 0 0
1993 17 2 0 0
1994 555 6 3 0
1995 933 44 30 21
1996 1612 1003 3356 3722
1997 2405 4262 7262 5453

```

dm5\_ms8a.log

1998 2111 3967 6992 5907  
1999 2653 2284 35603 12023  
2000 3685 20135 30318 13653

```

* qui replace VS_LC = 0 if VS_LC ==
* qui replace VS_NBID = 0 if VS_NBID ==
* qui replace VS_DBID = 0 if VS_DBID ==
* qui replace VS_P1 = 0 if VS_P1 ==

```

```

mkmat VS_LC
mkmat VS_DBID
mkmat VS_NBID
mkmat VS_P1

```

```

* matrix VS = VS_LC, VS_DBID, VS_NBID, VS_P1
* matrix drop VS_LC VS_DBID VS_NBID VS_P1
* matrix colnames VS = LC DBID NBID P1

```

```

* matrix rownames VS = 1992 1993 1994 1995 1996 1997 1998 1999 2000

```

```

* matrix li VS, format(%R,Of) title("SPA PDV LiqVal-AdmCost by Dx Year")

```

```

* (4) SPA PDV LiqVal-AdmCost by Dx Year

```

	LC	DBID	NBID	P1
1992	159784	71719	818	818
1993	131377	69287	790	790
1994	115516	72882	34051	768
1995	113591	69612	31336	16613
1996	106310	62012	31374	15464
1997	101889	59378	30011	14811
1998	97037	56279	28231	13909
1999	92715	52772	26779	12661
2000	86510	51710	25610	12710

```

* (4) Get P-matrix from ms7a
* Note: This file has a slightly format than cml (as used in dm3)
drop _all

```

```

* use ms8a_R2_r2_R1_r1
* Use only past estimates of P-matrix
* keep if Era == 0
* (3 observations deleted)

```

```

1.mod

```

	Era	Ränge	p11	p21	p31	p32
1.	1998	Lo	1.0000	0.0000	0.0000	0.0000
2.	1998	Med	1.0000	0.0000	0.0000	0.0000
3.	1998	Hi	1.0000	0.0000	0.0000	0.0000
4.	1998	Lo	1.0000	0.0000	0.0000	0.0000
5.	1998	Med	1.0000	0.0000	0.0000	0.0000
6.	1998	Hi	1.0000	0.0000	0.0000	0.0000
7.	1998	Lo	1.0000	0.0000	0.0000	0.0000
8.	1998	Med	1.0000	0.0000	0.0000	0.0000
9.	1998	Hi	1.0000	0.0000	0.0000	0.0000
10.	1998	Lo	1.0000	0.0000	0.0000	0.0000
11.	1998	Med	1.0000	0.0000	0.0000	0.0000
12.	1998	Hi	1.0000	0.0000	0.0000	0.0000
13.	1998	Lo	1.0000	0.0000	0.0000	0.0000
14.	1998	Med	1.0000	0.0000	0.0000	0.0000
15.	1998	Hi	1.0000	0.0000	0.0000	0.0000
16.	1998	Lo	1.0000	0.0000	0.0000	0.0000
17.	1998	Med	1.0000	0.0000	0.0000	0.0000
18.	1998	Hi	1.0000	0.0000	0.0000	0.0000
19.	1998	Lo	1.0000	0.0000	0.0000	0.0000
20.	1998	Med	1.0000	0.0000	0.0000	0.0000
21.	1998	Hi	1.0000	0.0000	0.0000	0.0000
22.	1998	Lo	1.0000	0.0000	0.0000	0.0000
23.	1998	Med	1.0000	0.0000	0.0000	0.0000
24.	1998	Hi	1.0000	0.0000	0.0000	0.0000
25.	1998	Lo	1.0000	0.0000	0.0000	0.0000
26.	1998	Med	1.0000	0.0000	0.0000	0.0000
27.	1998	Hi	1.0000	0.0000	0.0000	0.0000
28.	1998	Lo	1.0000	0.0000	0.0000	0.0000
29.	1998	Med	1.0000	0.0000	0.0000	0.0000
30.	1998	Hi	1.0000	0.0000	0.0000	0.0000
31.	1998	Lo	1.0000	0.0000	0.0000	0.0000
32.	1998	Med	1.0000	0.0000	0.0000	0.0000
33.	1998	Hi	1.0000	0.0000	0.0000	0.0000
34.	1998	Lo	1.0000	0.0000	0.0000	0.0000
35.	1998	Med	1.0000	0.0000	0.0000	0.0000
36.	1998	Hi	1.0000	0.0000	0.0000	0.0000
37.	1998	Lo	1.0000	0.0000	0.0000	0.0000
38.	1998	Med	1.0000	0.0000	0.0000	0.0000
39.	1998	Hi	1.0000	0.0000	0.0000	0.0000
40.	1998	Lo	1.0000	0.0000	0.0000	0.0000
41.	1998	Med	1.0000	0.0000	0.0000	0.0000
42.	1998	Hi	1.0000	0.0000	0.0000	0.0000
43.	1998	Lo	1.0000	0.0000	0.0000	0.0000
44.	1998	Med	1.0000	0.0000	0.0000	0.0000
45.	1998	Hi	1.0000	0.0000	0.0000	0.0000
46.	1998	Lo	1.0000	0.0000	0.0000	0.0000
47.	1998	Med	1.0000	0.0000	0.0000	0.0000
48.	1998	Hi	1.0000	0.0000	0.0000	0.0000
49.	1998	Lo	1.0000	0.0000	0.0000	0.0000
50.	1998	Med	1.0000	0.0000	0.0000	0.0000
51.	1998	Hi	1.0000	0.0000	0.0000	0.0000
52.	1998	Lo	1.0000	0.0000	0.0000	0.0000
53.	1998	Med	1.0000	0.0000	0.0000	0.0000
54.	1998	Hi	1.0000	0.0000	0.0000	0.0000
55.	1998	Lo	1.0000	0.0000	0.0000	0.0000
56.	1998	Med	1.0000	0.0000	0.0000	0.0000
57.	1998	Hi	1.0000	0.0000	0.0000	0.0000
58.	1998	Lo	1.0000	0.0000	0.0000	0.0000
59.	1998	Med	1.0000	0.0000	0.0000	0.0000
60.	1998	Hi	1.0000	0.0000	0.0000	0.0000
61.	1998	Lo	1.0000	0.0000	0.0000	0.0000
62.	1998	Med	1.0000	0.0000	0.0000	0.0000
63.	1998	Hi	1.0000	0.0000	0.0000	0.0000
64.	1998	Lo	1.0000	0.0000	0.0000	0.0000
65.	1998	Med	1.0000	0.0000	0.0000	0.0000
66.	1998	Hi	1.0000	0.0000	0.0000	0.0000
67.	1998	Lo	1.0000	0.0000	0.0000	0.0000
68.	1998	Med	1.0000	0.0000	0.0000	0.0000
69.	1998	Hi	1.0000	0.0000	0.0000	0.0000
70.	1998	Lo	1.0000	0.0000	0.0000	0.0000
71.	1998	Med	1.0000	0.0000	0.0000	0.0000
72.	1998	Hi	1.0000	0.0000	0.0000	0.0000
73.	1998	Lo	1.0000	0.0000	0.0000	0.0000
74.	1998	Med	1.0000	0.0000	0.0000	0.0000
75.	1998	Hi	1.0000	0.0000	0.0000	0.0000
76.	1998	Lo	1.0000	0.0000	0.0000	0.0000
77.	1998	Med	1.0000	0.0000	0.0000	0.0000
78.	1998	Hi	1.0000	0.0000	0.0000	0.0000
79.	1998	Lo	1.0000	0.0000	0.0000	0.0000
80.	1998	Med	1.0000	0.0000	0.0000	0.0000
81.	1998	Hi	1.0000	0.0000	0.0000	0.0000
82.	1998	Lo	1.0000	0.0000	0.0000	0.0000
83.	1998	Med	1.0000	0.0000	0.0000	0.0000
84.	1998	Hi	1.0000	0.0000	0.0000	0.0000
85.	1998	Lo	1.0000	0.0000	0.0000	0.0000
86.	1998	Med	1.0000	0.0000	0.0000	0.0000
87.	1998	Hi	1.0000	0.0000	0.0000	0.0000
88.	1998	Lo	1.0000	0.0000	0.0000	0.0000
89.	1998	Med	1.0000	0.0000	0.0000	0.0000
90.	1998	Hi	1.0000	0.0000	0.0000	0.0000
91.	1998	Lo	1.0000	0.0000	0.0000	0.0000
92.	1998	Med	1.0000	0.0000	0.0000	0.0000
93.	1998	Hi	1.0000	0.0000	0.0000	0.0000
94.	1998	Lo	1.0000	0.0000	0.0000	0.0000
95.	1998	Med	1.0000	0.0000	0.0000	0.0000
96.	1998	Hi	1.0000	0.0000	0.0000	0.0000
97.	1998	Lo	1.0000	0.0000	0.0000	0.0000
98.	1998	Med	1.0000	0.0000	0.0000	0.0000
99.	1998	Hi	1.0000	0.0000	0.0000	0.0000
100.	1998	Lo	1.0000	0.0000	0.0000	0.0000
101.	1998	Med	1.0000	0.0000	0.0000	0.0000
102.	1998	Hi	1.0000	0.0000	0.0000	0.0000
103.	1998	Lo	1.0000	0.0000	0.0000	0.0000
104.	1998	Med	1.0000	0.0000	0.0000	0.0000
105.	1998	Hi	1.0000	0.0000	0.0000	0.0000
106.	1998	Lo	1.0000	0.0000	0.0000	0.0000
107.	1998	Med	1.0000	0.0000	0.0000	0.0000
108.	1998	Hi	1.0000	0.0000	0.0000	0.0000
109.	1998	Lo	1.0000	0.0000	0.0000	0.0000
110.	1998	Med	1.0000	0.0000	0.0000	0.0000
111.	1998	Hi	1.0000	0.0000	0.0000	0.0000
112.	1998	Lo	1.0000	0.0000	0.0000	0.0000
113.	1998	Med	1.0000	0.0000	0.0000	0.0000
114.	1998	Hi	1.0000	0.0000	0.0000	0.0000
115.	1998	Lo	1.0000	0.0000	0.0000	0.0000
116.	1998	Med	1.0000	0.0000	0.0000	0.0000
117.	1998	Hi	1.0000	0.0000	0.0000	0.0000
118.	1998	Lo	1.0000	0.0000	0.0000	0.0000
119.	1998	Med	1.0000	0.0000	0.0000	0.0000
120.	1998	Hi	1.0000	0.0000	0.0000	0.0000
121.	1998	Lo	1.0000	0.0000	0.0000	0.0000
122.	1998	Med	1.0000	0.0000	0.0000	0.0000
123.	1998	Hi	1.0000	0.0000	0.0000	0.0000
124.	1998	Lo	1.0000	0.0000	0.0000	0.0000
125.	1998	Med	1.0000	0.0000	0.0000	0.0000
126.	1998	Hi	1.0000	0.0000	0.0000	0.0000
127.	1998	Lo	1.0000	0.0000	0.0000	0.0000
128.	1998	Med	1.0000	0.0000	0.0000	0.0000
129.	1998	Hi	1.0000	0.0000	0.0000	0.0000
130.	1998	Lo	1.0000	0.0000	0.0000	0.0000
131.	1998	Med	1.0000	0.0000	0.0000	0.0000
132.	1998	Hi	1.0000	0.0000	0.0000	0.0000
133.	1998	Lo	1.0000	0.0000	0.0000	0.0000
134.	1998	Med	1.0000	0.0000	0.0000	0.0000
135.	1998	Hi	1.0000	0.0000	0.0000	0.0000

dm5\_ms8a.log

```
r4 0 0 0 1
Case: 3
```

```
Symmetric P(4,4)
c1 c2 c3 c4
```

```
t1 1
t2 0 1
t3 0 0 1
t4 0 0 0 1
```

```
1 Era Range PDV_R PDV_S.nod
```

```
1. Era Range PDV_RICO PDV_SFA
Past Lo 0.0 0.0
Past Med 0.0 0.0
Past Hi 0.0 0.0
```

```
* Display results for median case for graphs and tables
drop_all
```

```
* Financial injury by year
svmat FR
number of observations will be reset to 9
Press any key to continue, or Break to abort
obs was 0, now 9
```

```
svmat FS
```

```
* qui replace FR = FR/le5
```

```
* qui replace FS = FS/le6
```

```
* gen int year = _n - 1991
```

```
svmat ZR
```

```
ren ZR1 ZR_LC
```

```
ren ZR2 ZR_DBID
```

```
ren ZR3 ZR_NBID
```

```
ren ZR4 ZR_P1
```

```
svmat ZS
```

```
ren ZS1 ZS_LC
```

```
ren ZS2 ZS_DBID
```

```
ren ZS3 ZS_NBID
```

```
ren ZS4 ZS_P1
```

```
* order y FR FS ZR* ZS*
```

```
* form F* Z* FR.0f
```

```
1 y F*.nod
```

```
Year 1991 1992 1993
FR 0 0 0
FS 0 0 0
```

produced by RJRTC

1 y Z\*.nod

Year	ZR_LC	ZR_DBID	ZR_NBID	ZR_P1	ZS_LC	ZS_DBID	ZS_
1991	0	0	0	0	14	1	
1992	0	0	0	0	17	2	
1993	0	0	0	0	555	6	
1994	0	0	0	0	933	44	
1995	0	0	0	0	1612	1003	
1996	3722	601	1165	1024	2405	4262	
1997	5455	1408	3823	3811	2111	3967	
1998	5907	2265	24116	8291	2653	22284	3
1999	72023	2960	15359	10674	3685	20135	3
2000	13653						

```
* save Claims_P.replace
(Note: file Claims_P.dta not found)
file Claims_P.dta saved
```

```
* log close
```

go to: tab 73, p. 6 (formatted)

WEW3, p. 4, p. 14

Wecker changes:

- remove embosus - page quit and initiation rate effects (see p. 15, p. 26 this tab)
- remove general quit and initiation rate effects (see p. 15, 26 this tab)

52614 0911

41

COMMIT - FOLLOWUP - COMMIT - DATA - 1988  
- 1993

**Table:** Predictors of Smoking Cessation Between 1988 and 1993 as reported by Hymowitz (1997; Tbl 2) Plus Occupational Group, Estimated Using Logistic Regression from COMMIT Data Produced by Cummings (11/10/00)

*Sample data -*

			As Reported by Hymowitz (1997; Table 2)			Predictors Used by Hymowitz (1997; Table 2) & Occup. Group	
Characteristic	Sample Size	% Quit	Odds Ratio*	95% CI	P-value	Odds Ratio	95% CI
COMMIT Community**							
0 Comparison	6,733	23.4%	1.00	Referent		1.00	Referent
1 Intervention	6,682	24.6%	1.07	0.98 - 1.17	0.1108	1.07	0.98 - 1.17
Sex							
Male	6,599	24.0%	1.00	Referent		1.00	Referent
Female	6,816	23.9%	0.86	0.78 - 0.94	0.0009	0.86	0.78 - 0.95
Age (years)							
25-34	4,249	22.8%	1.00	Referent		1.00	Referent
35-44	4,249	22.0%	0.99	0.88 - 1.11	0.8649	0.99	0.88 - 1.11
45-54	2,817	24.6%	1.06	1.06 - 1.37	0.0038	1.20	1.06 - 1.37
55-64	2,100	29.3%	1.57	1.37 - 1.81	<.0001	1.57	1.36 - 1.80
Race							
White	10,072	23.3%	1.00	Referent		1.00	Referent
Black	682	27.7%	0.98	0.82 - 1.17	0.8362	0.98	0.82 - 1.17
Hispanic	697	30.0%	1.05	0.87 - 1.28	0.5918	1.05	0.87 - 1.28
Canadian	1,449	23.1%	0.95	0.81 - 1.13	0.6142	0.95	0.81 - 1.12
Asian	138	28.3%	0.91	0.59 - 1.37	0.6274	0.91	0.60 - 1.39
American Indian	117	20.5%	0.89	0.55 - 1.45	0.6470	0.89	0.55 - 1.44
Other	42	33.3%	1.49	0.73 - 3.02	0.2695	1.50	0.74 - 3.05
Annual household income							
<\$10,000	1,139	20.3%	1.00	Referent		1.00	Referent
\$10,000 - \$25,000	3,750	22.2%	1.15	0.97 - 1.38	0.1168	1.14	0.95 - 1.36
\$25,001 - \$40,000	4,087	24.2%	1.44	1.12 - 1.61	0.0014	1.32	1.10 - 1.58
>\$40,000	3,456	26.0%	1.47	1.22 - 1.77	<.0001	1.44	1.19 - 1.73
Education (years)							
<12	2,528	22.4%	1.00	Referent		1.00	Referent
12	3,237	23.9%	1.03	0.89 - 1.19	0.6681	1.02	0.88 - 1.18
13-15	5,367	23.5%	1.00	0.87 - 1.15	0.9944	0.98	0.85 - 1.13
≥16	2,257	26.9%	1.05	0.89 - 1.23	0.6012	1.00	0.84 - 1.19
Frequency of alcohol consumption							
Daily	1,572	20.9%	1.00	Referent		1.00	Referent
3-4 times/week	1,286	21.0%	0.98	0.80 - 1.19	0.8273	0.98	0.80 - 1.19
1-2 times/week	3,064	23.4%	1.09	0.93 - 1.29	0.2829	1.09	0.93 - 1.29
1-3 times/month	2,299	24.8%	1.24	1.05 - 1.47	0.0137	1.24	1.05 - 1.48
<1/month or never	5,100	25.6%	1.35	1.16 - 1.57	0.0001	1.35	1.16 - 1.58

p.14 (tbl 2)  
we w3, p.2 for 2

we w3, p.4

BEST IMAGE

52614 0912

## Cigarettes smoked daily in 1988

>=25	5,566	18.7%	1.00	Referent		1.00	Referent
15-24	4,783	22.7%	1.15	1.03 - 1.29	0.0103	1.15	1.03 - 1.29
5-14	2,356	32.4%	1.59	1.38 - 1.83	<.0001	1.59	1.38 - 1.83
<5	698	46.0%	2.38	1.92 - 2.96	<.0001	2.39	1.93 - 2.96

## Age started smoking (years)

<=15	3,225	21.2%	1.00	Referent		1.00	Referent
16-19	6,606	23.1%	1.03	0.92 - 1.16	0.5908	1.03	0.92 - 1.16
>=20	3,584	26.1%	1.16	1.01 - 1.32	0.0310	1.16	1.01 - 1.32

## Time to first cigarette (minutes)

<10	4,329	17.9%	1.00	Referent		1.00	Referent
10-30	3,960	21.1%	1.18	1.05 - 1.33	0.0069	1.18	1.05 - 1.33
31-60	2,431	26.2%	1.41	1.23 - 1.62	<.0001	1.41	1.23 - 1.62
>60	2,646	35.9%	1.84	1.59 - 2.14	<.0001	1.84	1.59 - 2.14

## Use non-cigarette product

No	13,003	24.0%	1.00	Referent		1.00	Referent
Yes	408	24.3%	0.66	0.66 - 1.12	0.2554	0.86	0.66 - 1.13

## Type of cigarette

Premium	12,078	24.4%	1.00	Referent		1.00	Referent
Discount	608	18.8%	0.85	0.68 - 1.07	0.1587	0.86	0.68 - 1.07
Generic	173	15.0%	0.64	0.41 - 0.99	0.0427	0.64	0.41 - 0.99

## Quit attempts during 12 months prior to baseline

0	8,235	22.6%	1.00	Referent		1.00	Referent
1	2,427	24.4%	1.07	0.95 - 1.21	0.2468	1.07	0.95 - 1.21
>=2	2,717	27.7%	1.14	1.01 - 1.29	0.0324	1.14	1.01 - 1.29

## Desire to quit

Not at all	2,200	22.2%	1.00	Referent		1.00	Referent
A little	2,116	22.9%	1.20	1.02 - 1.40	0.0286	1.20	1.02 - 1.40
Somewhat	4,126	22.9%	1.13	0.98 - 1.31	0.0890	1.13	0.98 - 1.31
A lot	4,882	26.0%	1.24	1.07 - 1.44	0.0037	1.24	1.07 - 1.44

## Number of other household smokers

0	7,206	25.5%	1.00	Referent		1.00	Referent
>=1	6,209	22.1%	0.87	0.80 - 0.95	0.0026	0.87	0.80 - 0.96

## Occupation Group

Blue Collar	4,586	22.7%				1.00	Referent
White Professional	3,753	26.2%				1.08	0.95 - 1.23
White Clerical / Sales	3,182	24.2%				1.03	0.91 - 1.17
None / Unknown	423	22.3%				0.94	0.81 - 1.10

\*Labelled as a relative risk by Hymowitz et. al.

\*\* Not originally presented in the paper

52614 0913

RR do not  
depend on  
occupation  
condition on  
other var  
in the  
logistic paper

cascade.lst

Men and Women No Profession

The LOGISTIC Procedure

# Model Information

Data Set WORK.TEMP1  
Response Variable QUITCIG quit in 1993  
Number of Response Levels 2  
Number of Observations 11734  
Link Function Logit  
Optimization Technique Fisher's scoring

Response Profile  
Ordered Value QUITCIG Total Frequency  
1 quit >=6mos. 2779  
2 smoker (includes 8955)

NOTE 1681 observations were deleted due to missing values for the response or explanatory variables.

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	12848.429	12389.930
SC	12855.800	12677.169
-2 Log L	12846.429	12311.869

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	534.4997	38	<.0001
Score	550.5468	38	<.0001
Wald	516.7112	38	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	-2.2856	0.1434	254.2090	<.0001
_sex	-0.1593	0.0479	11.0756	0.0009
COMMIT	0.0713	0.0445	2.5431	0.1108
_age1	-0.00989	0.0561	0.0290	0.8649
_age2	0.1889	0.0561	8.3561	0.0038
_age3	0.4542	0.0712	40.7199	<.0001
_race1	-0.0186	0.0899	0.0427	0.8362
_race2	0.0528	0.0985	0.2875	0.5918
_race3	-0.0428	0.0848	0.2541	0.6142
_race4	-0.1037	0.2137	0.2355	0.6274
_race5	-0.1124	0.2455	0.2097	0.6470
_race6	0.3986	0.3610	1.2195	0.2695
_inc1	0.1436	0.0915	2.4600	0.1168
_inc2	0.2947	0.0922	10.2250	0.0014
_inc3	0.3867	0.0952	16.4880	<.0001
_educ1	0.0317	0.0740	0.1838	0.6681
_educ2	0.000498	0.0705	0.0000	0.9944
_educ3	0.0436	0.0835	0.2732	0.6012
_alc1	-0.0219	0.1006	0.0476	0.8273
_alc2	0.0896	0.0834	1.1530	0.2829
_alc3	0.2160	0.0877	6.0714	0.0137
_alc4	0.2994	0.0788	14.4325	0.0001
_amt1	0.1420	0.0554	6.5752	0.0103
_amt2	0.4617	0.0724	40.6633	<.0001
_amt3	0.8687	0.1098	62.6249	<.0001
_str1	0.0319	0.0593	0.2891	0.5908
_str2	0.1460	0.0677	4.6529	0.0310
_frst1	0.1661	0.0615	7.2929	0.0069
_frst2	0.3440	0.0701	24.0951	<.0001
_frst3	0.6122	0.0756	65.6418	<.0001
_nonc	-0.1544	0.1358	1.2937	0.2554
_preml	-0.1603	0.1138	1.9461	0.1587
_preml	-0.4519	0.2229	4.1030	0.0427

p-values

→ P1

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3



cascade.lst

_quit1	1	0.0714	0.0616	1.3411	0.2468
_quit2	1	0.1315	0.0615	4.5753	0.0324
_want1	1	0.1784	0.0820	4.7300	0.0296
_want2	1	0.1244	0.0732	2.8918	0.0890
_want3	1	0.2174	0.0749	8.4298	0.0037
_nums	1	-0.1377	0.0456	9.1032	0.0026

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
_sex	0.853	0.776	0.937
COMMIT	1.074	0.984	1.172
_age1	0.990	0.884	1.110
_age2	1.308	1.063	1.373
_age3	0.575	1.370	1.811
_race1	0.982	0.823	1.171
_race2	1.054	0.869	1.279
_race3	0.858	0.811	1.131
_race4	0.901	0.593	1.371
_race5	0.894	0.552	1.446
_race6	1.190	0.734	3.023
_inc1	0.154	0.965	1.381
_inc2	1.143	1.121	1.164
_inc3	1.172	1.221	1.124
_educ1	1.032	0.893	1.193
_educ2	0.900	0.871	1.144
_educ3	1.045	0.887	1.330
_alc1	0.778	0.803	1.192
_alc2	1.094	0.929	1.288
_alc3	0.241	1.045	1.474
_alc4	0.449	1.156	1.521
_amt1	1.153	1.034	1.285
_amt2	1.587	1.377	1.833
_amt3	2.384	1.922	2.956
_strt1	1.032	0.919	1.160
_strt2	1.137	1.013	1.271
_frst1	1.167	1.047	1.332
_frst2	0.411	1.230	1.334
_frst3	1.144	1.541	2.139
_nonc	0.857	0.847	1.118
_preml	0.852	0.682	1.065
_preml	0.636	0.441	0.884
_quit1	1.074	0.952	1.212
_quit2	1.141	1.011	1.279
_want1	1.195	1.018	1.404
_want2	1.133	0.981	1.302
_want3	1.243	1.073	1.439
_nums	0.871	0.797	0.953

→ P1

Association of Predicted Probabilities and Observed Responses

Percent Concordant	63.8	Somers' D	0.283
Percent Discordant	35.5	Gamma	0.285
Percent Tied	0.6		0.102
Pairs	24885945	c	0.642

cascade.lst

Men, No Profession  
The LOGISTIC Procedure

# Model Information

Data Set WORK.TEMP1  
Response Variable QUITCIG quit in 1993  
Number of Response Levels 2  
Number of Observations 5841  
Link Function Logit  
Optimization Technique Fisher's scoring

## Response Profile

Ordered Value	QUITCIG	Total Frequency
1	quit >=6mos.	1395
2	smoker (includes	4446

NOTE: 79 observations were deleted due to missing values for the response or explanatory variables.

## Model Convergence Status

Convergence criterion (GCONV=1E-6) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	6423.903	6269.768
SC	6430.576	6528.329
-2 Log L	6421.903	6198.218

## Testing Global Null Hypothesis: BTA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	228.1350	37	<.0001
Score	234.2620	37	<.0001
Wald	222.0174	37	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	-2.0721	0.0022	105.0442	<.0001
COMMIT	0.0157	0.0631	0.0618	0.8037
_age1	0.0443	0.0092	0.2997	0.5841
_age2	0.1157	0.0932	1.5090	0.2193
_age3	0.4867	0.0088	23.7667	<.0001
_race1	-0.1477	0.1968	1.1652	0.2804
_race2	0.0467	0.1306	0.1282	0.7203
_race3	0.0118	0.1163	0.0102	0.9195
_race4	-0.2787	0.2627	1.1254	0.2888
_race5	-0.0826	0.3280	0.0634	0.8012
_race6	0.2713	0.4963	0.2988	0.5846
_inc1	0.1930	0.1490	1.6782	0.1952
_inc2	0.3014	0.1486	4.1169	0.0425
_inc3	0.4769	0.1507	10.0162	0.0016
_educ1	-0.00536	0.1050	0.0026	0.9593
_educ2	-0.0742	0.0979	0.5742	0.4486
_educ3	-0.00780	0.1147	0.0046	0.9458
_alc1	0.0156	0.1222	0.0163	0.8984
_alc2	0.1032	0.1025	1.0141	0.3139
_alc3	0.2151	0.1139	3.5682	0.0589
_alc4	0.3298	0.0986	11.1856	0.0008
_amt1	0.1366	0.0754	3.2771	0.0703
_amt2	0.4088	0.1078	14.3800	0.0001
_amt3	0.7296	0.1605	20.6711	<.0001
_str1	0.0734	0.0781	0.8829	0.3474
_str2	0.1797	0.0940	3.6576	0.0558
_frst1	0.0127	0.0853	0.0222	0.8816
_frst2	0.3172	0.0951	11.1173	0.0009
_frst3	0.5068	0.1076	22.1837	<.0001
_nonc	-0.1263	0.1403	0.8109	0.3678
_preml	-0.1567	0.1661	0.8899	0.3455
_preml2	-0.4258	0.3121	1.8617	0.1724
_quit1	0.1484	0.0858	2.9908	0.0837

Logistic Recr like C 1997  
Non Commit men only

new3, p.2 fn=

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cascade.lst

_quit2	1	0.2472	0.0889	7.7412	0.0054
_want1	1	-0.0537	0.1133	0.2249	0.6353
_want2	1	-0.0429	0.0999	0.1848	0.6673
_want3	1	-0.00781	0.1018	0.0059	0.9389
_nums	1	-0.1531	0.0645	5.6446	0.0175

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
COMMIT	1.016	0.898 1.149
_age1	1.045	0.892 1.225
_age2	1.123	0.933 1.350
_age3	1.627	1.338 1.978
_race1	0.663	0.660 1.128
_race2	0.648	0.811 1.353
_race3	1.012	0.806 1.271
_race4	0.757	0.452 1.266
_race5	0.421	0.484 1.751
_race6	1.112	0.496 3.469
_inc1	1.213	0.906 1.624
_inc2	1.452	1.010 1.809
_inc3	1.611	1.199 2.165
_educ1	0.895	0.810 1.000
_educ2	0.729	0.766 1.125
_educ3	0.992	0.792 1.242
_alc1	1.116	0.799 1.294
_alc2	1.109	0.907 1.355
_alc3	1.140	0.992 1.550
_alc4	1.191	1.146 1.684
_amt1	1.146	0.989 1.329
_amt2	1.105	1.218 1.439
_amt3	2.874	1.515 2.811
_strtl1	1.076	0.923 1.248
_strtl2	1.197	0.996 1.439
_frst1	1.013	0.857 1.193
_frst2	1.171	1.140 1.653
_frst3	1.660	1.344 2.050
_nonc	0.881	0.849 1.144
_prem1	0.855	0.617 1.184
_prem2	0.653	0.454 1.204
_quit1	1.160	0.880 1.373
_quit2	1.280	1.076 1.525
_want1	0.748	0.759 1.183
_want2	0.758	0.788 1.184
_want3	0.992	0.813 1.211
_nums	0.858	0.756 0.974

Association of Predicted Probabilities and Observed Responses

Percent Concordant	63.0	Somers' D	0.266
Percent Discordant	36.3	G	0.268
Percent Tied	0.7	Tau-a	0.097
Pairs	6202170	c	0.633

cascade.lst

Men and Blue Collar

The LOGISTIC Procedure

# Model Information

Data Set WORK.TEMP1  
Response Variable QUITCIG quit in 1993  
Number of Response Levels 2  
Number of Observations 2747  
Link Function Logit  
Optimization Technique Fisher's scoring

## Response Profile

Ordered Value	QUITCIG	Total Frequency
1	quit >=6mos.	622
2	never (includes	2125

NOTE: 393 observations were deleted due to missing values for the response or explanatory variables.

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	2940.879	2898.566
SC	2946.797	3123.888
-2 Log L	2938.879	2822.566

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	116.3130	37	<.0001
Score	120.4250	37	<.0001
Wald	113.0423	37	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-2.1117	0.2794	57.1295	<.0001
COMMIT	1	0.0161	0.0292	0.0292	0.8643
_age1	1	-0.0123	0.0201	0.0104	0.9187
_age2	1	0.1286	0.0386	0.8594	0.3539
_age3	1	0.6019	0.1666	16.8464	<.0001
_race1	1	-0.2704	0.1957	1.9093	0.1670
_race2	1	0.0999	0.1804	0.3064	0.5799
_race3	1	-0.0713	0.1635	0.1899	0.6630
_race4	1	-0.4066	0.4579	0.7886	0.3745
_race5	1	0.0932	0.4305	0.0468	0.8287
_race6	1	-0.3444	0.7913	0.1894	0.6634
_inc1	1	0.2966	0.1916	2.3970	0.1216
_inc2	1	0.3563	0.1958	3.3138	0.0687
_inc3	1	0.7043	0.2051	11.7950	0.0006
_educ1	1	-0.00883	0.1300	0.0046	0.9459
_educ2	1	-0.0379	0.1290	0.0866	0.7686
_educ3	1	0.0292	0.2316	0.0159	0.8996
_alc1	1	-0.1102	0.1941	0.3223	0.5702
_alc2	1	0.1235	0.1539	0.6435	0.4224
_alc3	1	0.0246	0.1759	0.0196	0.8887
_alc4	1	0.2576	0.1470	3.0706	0.0797
_amt1	1	-0.0232	0.1114	0.0435	0.8348
_amt2	1	0.1655	0.1661	0.9923	0.3192
_amt3	1	0.5940	0.2644	5.0461	0.0247
_strtl	1	0.0223	0.1087	0.0420	0.8376
_strt2	1	0.0377	0.1416	0.0707	0.7903
_frst1	1	0.0493	0.1248	0.1523	0.6926
_frst2	1	0.3332	0.1421	5.4375	0.0130
_frst3	1	0.7462	0.1586	22.1424	<.0001
_none	1	-0.1542	0.2048	0.5671	0.4514
_prem1	1	-0.1987	0.2522	0.6205	0.4308
_prem2	1	0.00272	0.4157	0.0000	0.9348
_quit1	1	0.0553	0.1332	0.1722	0.6782

Let's C 1997, P 560  
+ like P1 this too  
but, Blue Collar Man only  
Comm. T

wew3, p3 Fr 7

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cascade.lst

Men and Blue Collar and No College

The LOGISTIC Procedure

# Model Information

Data Set WORK.TEMP1  
Response Variable QUITCIG quit in 1993  
Number of Response Levels 2  
Number of Observations 1560  
Link Function Logit  
Optimization Technique Fisher's scoring

*Like p7  
but no college*

## Response Profile

Ordered Value	QUITCIG	Total Frequency
1	quit >=6mos.	356
2	smoker (includes	1204

NOTE: 27 observations were deleted due to missing values for the response or explanatory variables.

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	1677.747	1667.128
SC	1683.100	1853.816
-2 Log L	1675.747	1589.128

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	86.6196	35	<.0001
Score	85.7917	35	<.0001
Wald	78.3012	35	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	-1.9902	0.3457	33.4190	<.0001
COMMIT	-0.0416	0.1260	0.1089	0.7414
_age1	0.0140	0.0940	0.0065	0.9357
_age2	0.1861	0.1823	1.0417	0.3074
_age3	0.8033	0.1770	19.7473	<.0001
_race1	-0.1946	0.2526	0.5936	0.4410
_race2	0.0120	0.2411	0.0025	0.9602
_race3	0.0284	0.1785	0.0253	0.8736
_race4	-13.6471	492.4	0.0008	0.9779
_race5	0.1936	0.5536	0.1223	0.7265
_race6	-0.4055	1.1332	0.1280	0.7205
_inc1	0.2579	0.2363	1.1918	0.2750
_inc2	0.2715	0.2459	1.2190	0.2696
_inc3	0.5181	0.2688	3.7168	0.0539
_educ1	0.0630	0.1353	0.2167	0.6415
_alc1	-0.3581	0.2793	1.6444	0.1997
_alc2	-0.1003	0.2046	0.2402	0.6240
_alc3	0.0113	0.2132	0.0024	0.9613
_alc4	0.2208	0.1874	1.3894	0.2385
_amt1	-0.0596	0.1473	0.1639	0.6856
_amt2	0.0382	0.2275	0.0282	0.8666
_amt3	0.5913	0.3690	2.5675	0.1091
_str1	0.2663	0.1406	3.5869	0.0582
_str2	-0.1131	0.2091	0.2927	0.5885
_frst1	0.0362	0.1638	0.0489	0.8250
_frst2	0.4536	0.1898	5.7116	0.0169
_frst3	0.7029	0.2108	11.1147	0.0009
_nonc	-0.2640	0.2839	0.8644	0.3525
_prem1	-0.5816	0.3775	2.3737	0.1234
_prem2	-0.1299	0.6669	0.0379	0.8456
_quit1	0.0601	0.1802	0.1111	0.7388
_quit2	0.1905	0.1732	1.2102	0.2713
_want1	-0.1021	0.2120	0.2318	0.6302

*wew3, p.3 fn 7 "also see"*

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cascade.lst

_want2	1	0.0354	0.2056	0.0297	0.8632
_want3	1	0.0531	0.1945	0.0744	0.7850
_nums	1	-0.2313	0.1274	3.2939	0.0695

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
COMMIT	0.959	0.749	1.228
_age1	1.014	0.721	1.426
_age2	1.205	0.843	1.722
_age3	2.233	1.567	3.182
_race1	0.823	0.502	1.350
_race2	1.812	0.631	1.623
_race3	1.829	0.725	1.460
_race4	0.001	<0.001	>999.999
_race5	1.214	0.410	3.592
_race6	0.667	0.072	6.145
_inc1	1.194	0.815	2.056
_inc2	1.312	0.810	2.124
_inc3	1.679	0.991	2.843
_educ1	1.065	0.817	1.388
_alc1	1.699	0.404	1.208
_alc2	0.805	0.606	1.088
_alc3	1.011	0.640	1.597
_alc4	1.247	0.864	1.800
_amt1	1.042	0.706	1.297
_amt2	1.039	0.665	1.623
_amt3	1.006	0.876	1.149
_strt1	1.005	0.991	1.019
_strt2	0.893	0.593	1.345
_frst1	1.037	0.752	1.450
_frst2	1.874	1.085	2.783
_frst3	2.020	1.336	3.000
_nonc	0.768	0.440	1.340
_preml	0.559	0.267	1.121
_prem2	0.878	0.238	3.245
_quit1	1.082	0.746	1.512
_quit2	0.810	0.482	1.338
_want1	0.903	0.586	1.368
_want2	1.036	0.642	1.550
_want3	1.055	0.720	1.544
_nums	0.794	0.628	0.999

Association of Predicted Probabilities and Observed Responses

Percent Concordant	65.0	Somers' D	0.306
Percent Discordant	34.4	Gambino's	0.308
Percent Tied	0.6	Tau-a	0.108
Pairs	428624	c	0.653

cascade.lst

Men and Blue Collar and Less Than College Graduate

The LOGISTIC Procedure

# Model Information

Data Set WORK.TEMP1  
Response Variable QUITCIG quit in 1993  
Number of Response Levels 2  
Number of Observations 2609  
Link Function Logit  
Optimization Technique Fisher's scoring

## Response Profile

Ordered Value	QUITCIG	Total Frequency
1	quit >=6mos.	588
2	worker (includes	2021

NOTE: 382 observations were deleted due to missing values for the response or explanatory variables.

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	2786.459	2752.145
SC	2792.325	2969.811
-2 Log L	2784.459	2678.145

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	106.3137	16	<.0001
Score	109.5460	16	<.0001
Wald	103.1627	16	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept		-2.0742	0.2846	53.1209	<.0001
COMMIT	1	0.0428	0.0713	0.1959	0.6581
_age1	1	0.0567	0.1218	0.2098	0.6469
_age2	1	0.0980	0.1437	0.4650	0.4953
_age3	1	0.6073	0.1437	16.5228	<.0001
_race1	1	-0.3081	0.2039	2.2820	0.1309
_race2	1	0.0479	0.1841	0.0676	0.7948
_race3	1	-0.0844	0.1640	0.2647	0.6069
_race4	1	-0.6691	0.5239	1.6315	0.2015
_race5	1	0.0346	0.4576	0.0057	0.9397
_race6	1	-0.3014	0.7975	0.1429	0.7055
_inc1	1	0.3132	0.1963	2.5466	0.1105
_inc2	1	0.3580	0.2003	3.1956	0.0738
_inc3	1	0.6556	0.2115	9.6113	0.0019
_educ1	1	-0.0145	0.1103	0.0124	0.9112
_educ2	1	-0.0418	0.1296	0.1038	0.7473
_alc1	1	-0.1367	0.2015	0.4603	0.4975
_alc2	1	0.1048	0.1587	0.4364	0.5089
_alc3	1	0.0188	0.1812	0.0108	0.9173
_alc4	1	0.2820	0.1512	3.4771	0.0622
_amt1	1	-0.0650	0.1140	0.3253	0.5684
_amt2	1	0.0995	0.1733	0.3295	0.5659
_amt3	1	0.5740	0.2738	4.3958	0.0360
_str1	1	0.0540	0.1110	0.2367	0.6266
_str2	1	0.0627	0.1473	0.1808	0.6707
_frst1	1	0.0533	0.1277	0.1739	0.6767
_frst2	1	0.3602	0.1454	6.1393	0.0132
_frst3	1	0.7464	0.1639	20.7260	<.0001
_none	1	-0.2341	0.2125	1.2139	0.2706
_pre1	1	-0.2812	0.2635	1.1388	0.2859
_pre2	1	0.0197	0.4176	0.0022	0.9624
_quit1	1	0.0561	0.1372	0.2324	0.6298
_quit2	1	0.2538	0.1329	3.6458	0.0562

Like p7  
but LT College grad

new2, p.3 for 7 "also see"

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cascade.lst

_want1	1	-0.1173	0.1683	0.4857	0.4859
_want2	1	0.0558	0.1542	0.1311	0.7173
_want3	1	0.0128	0.1522	0.0071	0.9328
_nums	1	-0.1282	0.0979	1.7151	0.1903

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
COMMIT	1.044	0.864 1.262
_age1	1.058	0.830 1.349
_age2	1.103	0.832 1.462
_age3	1.335	1.370 2.460
_race1	0.735	0.493 1.096
_race2	1.049	0.731 1.505
_race3	0.919	0.666 1.267
_race4	0.512	0.183 1.430
_race5	1.035	0.422 2.538
_race6	0.340	0.155 3.531
_inc1	1.368	0.931 2.009
_inc2	1.430	0.966 2.118
_inc3	1.026	1.273 2.915
_educ1	0.986	0.763 1.272
_educ2	0.559	0.744 1.213
_alc1	0.872	0.588 1.295
_alc2	1.111	0.814 1.516
_alc3	1.049	0.714 1.454
_alc4	1.006	0.986 1.783
_amt1	0.837	0.749 1.551
_amt2	0.705	0.786 1.551
_amt3	1.775	1.038 1.016
_strt1	0.555	0.849 1.551
_strt2	1.065	0.798 1.521
_frst1	1.055	0.821 1.551
_frst2	1.434	1.078 1.906
_frst3	1.109	1.530 1.551
_nonc	0.793	0.522 1.200
_prem1	0.755	0.450 1.265
_prem2	1.020	0.450 1.551
_quit1	1.068	0.846 1.398
_quit2	1.289	0.993 1.672
_want1	0.889	0.689 1.217
_want2	1.057	0.782 1.491
_want3	0.913	0.752 1.365
_nums	0.880	0.726 1.265

Association of Predicted Probabilities and Observed Responses

Percent Concordant	62.8	Somers' D	0.262
Percent Discordant	36.5	Gamma	0.264
Percent Tied	0.7	Tau-a	0.092
Pairs	1188348	c	0.631



cascade.lst

Men and Women (Occupation)

The LOGISTIC Procedure

# Model Information

Data Set WORK.TEMP1  
Response Variable QUITCIG quit in 1993  
Number of Response Levels 2  
Number of Observations 11734  
Link Function Logit  
Optimization Technique Fisher's scoring

## Response Profile

Ordered Value	QUITCIG	Total Frequency
1	quit >=6mos.	2779
2	worker (includes	8955

NOTE: 1681 observations were deleted due to missing values for the response or explanatory variables.

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	12848.429	12392.645
SC	12855.800	12708.733
-2 Log L	12846.429	12398.645

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	537.7846	41	<.0001
Score	553.7268	41	<.0001
Wald	519.4951	41	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept		-2.2725	0.1441	248.8041	<.0001
_sex	1	-0.1519	0.0508	8.9476	0.0028
COMM17	1	0.0704	0.0477	2.4800	0.1153
_age1	1	-0.0143	0.0512	0.0607	0.8054
_age2	1	0.1827	0.0734	7.7959	0.0052
_age3	1	0.4483	0.0713	39.5563	<.0001
_race1	1	-0.0242	0.0901	0.0720	0.7885
_race2	1	0.0506	0.0986	0.2634	0.6078
_race3	1	-0.0494	0.0849	0.3386	0.5606
_race4	1	-0.0926	0.2139	0.1875	0.6650
_race5	1	-0.1153	0.2456	0.2205	0.6387
_race6	1	0.4057	0.3611	1.2621	0.2613
_inc1	1	0.1278	0.0921	1.9276	0.1650
_inc2	1	0.2735	0.0930	8.6413	0.0033
_inc3	1	0.3612	0.0965	14.0088	0.0002
_educ1	1	0.0230	0.0745	0.0952	0.7577
_educ2	1	-0.0197	0.0724	0.0743	0.7851
_educ3	1	-0.00054	0.0891	0.0000	0.9951
_alc1	1	-0.0209	0.1006	0.0432	0.8354
_alc2	1	0.0902	0.0834	1.1687	0.2797
_alc3	1	0.2171	0.0877	6.1324	0.0133
_alc4	1	0.3034	0.0788	14.8076	0.0001
_amt1	1	0.1423	0.0554	6.6050	0.0102
_amt2	1	0.4605	0.0724	40.4296	<.0001
_amt3	1	0.8707	0.1099	62.8118	<.0001
_strtl1	1	0.0306	0.0594	0.2658	0.6062
_strtl2	1	0.1452	0.0677	4.5967	0.0320
_frst1	1	0.1674	0.0615	7.3927	0.0065
_frst2	1	0.3446	0.0701	24.1694	<.0001
_frst3	1	0.6107	0.0756	65.3168	<.0001
_nonc	1	-0.1487	0.1358	1.1987	0.2736
_preml	1	-0.1560	0.1138	1.8781	0.1706
_preml2	1	-0.4456	0.2230	3.9924	0.0457

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cascade.lst

_quit1	1	0.0706	0.0617	1.3110	0.2522
_quit2	1	0.1299	0.0615	4.4656	0.0346
_want1	1	0.1779	0.0821	4.7019	0.0301
_want2	1	0.1225	0.0732	2.8019	0.0942
_want3	1	0.2177	0.0749	8.4473	0.0037
_nums	1	-0.1347	0.0457	8.6884	0.0032
_white	1	0.0785	0.0645	1.4836	0.2232
_pink	1	0.0335	0.0638	0.2759	0.5994
_none	1	-0.0593	0.0798	0.5518	0.4576

note: Blue collar is the reference category

new 7, p.3 for 7

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
_sex	0.859	0.778 0.949
COMMIT	1.073	0.983 1.171
_age1	0.986	0.880 1.105
_age2	1.200	1.056 1.365
_age3	1.566	1.361 1.800
_race1	0.996	0.818 1.165
_race2	1.052	0.867 1.276
_race3	0.852	0.806 1.124
_race4	0.912	0.599 1.386
_race5	0.891	0.551 1.433
_race6	1.600	0.739 3.015
_inc1	1.136	0.949 1.361
_inc2	1.075	1.095 1.578
_inc3	1.433	1.188 1.784
_educ1	1.023	0.884 1.164
_educ2	0.830	0.851 1.130
_educ3	0.999	0.839 1.190
_alc1	0.979	0.804 1.199
_alc2	1.094	0.929 1.289
_alc3	1.242	1.046 1.463
_alc4	1.354	1.160 1.581
_amt1	1.153	1.034 1.285
_amt2	0.985	1.375 1.327
_amt3	2.389	1.926 2.963
_str1	1.031	0.823 1.299
_str2	1.136	1.013 1.320
_frst1	1.002	1.000 1.034
_frst2	1.411	1.238 1.610
_frst3	1.842	1.588 2.147
_none	0.662	0.660 1.125
_pre1	0.856	0.684 1.065
_pre2	0.740	0.414 0.992
_quit1	1.073	0.951 1.222
_quit2	1.139	1.009 1.285
_want1	1.095	1.017 1.403
_want2	1.130	0.979 1.305
_want3	1.243	1.073 1.440
_nums	0.874	0.799 0.956
_white	1.082	0.953 1.222
_pink	1.034	0.912 1.172
_none	0.842	0.806 1.102

p.1 This tab

Association of Predicted Probabilities and Observed Responses

Percent Concordant	63.9	Somers' D	0.285
Percent Discordant	35.4	Gamma	0.286
Percent Tied	0.6	Tau-a	0.103
Pairs	24885945	c	0.642

cascade.lst

Men (Occupation)

The LOGISTIC Procedure

# Model Information

Data Set WORK.TEMP1  
Response Variable QUITCIG quit in 1993  
Number of Response Levels 2  
Number of Observations 5841  
Link Function Logit  
Optimization Technique Fisher's scoring

## Response Profile

Ordered Value	QUITCIG	Total Frequency
1	quit >=6mos.	1395
2	worker (includes	4446

NOTE: 758 observations were deleted due to missing values for the response or explanatory variables.

## Model Convergence Criteria

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	6423.903	6273.145
SC	6430.576	6546.334
-2 Log L	6421.903	6191.145

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	230.7578	40	<.0001
Score	236.6964	40	<.0001
Wald	224.1694	40	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	-2.0292	0.2044	98.5264	<.0001
COMMIT	0.0135	0.0612	0.0457	0.8307
_age1	0.0396	0.0911	0.2380	0.6257
_age2	0.1095	0.0941	1.3456	0.2460
_age3	0.4749	0.1171	22.4447	<.0001
_race1	-0.1517	0.1171	1.2254	0.2683
_race2	0.0460	0.1306	0.1240	0.7248
_race3	0.00859	0.1164	0.0054	0.9412
_race4	-0.2621	0.2632	0.9921	0.3192
_race5	-0.0834	0.3264	0.0645	0.7996
_race6	0.2888	0.4958	0.3393	0.5602
_inc1	0.1579	0.1507	1.0981	0.2947
_inc2	0.2547	0.1515	2.8274	0.0927
_inc3	0.4253	0.1546	7.5699	0.0059
_educ1	-0.00947	0.1053	0.0081	0.9283
_educ2	-0.0835	0.1002	0.6940	0.4048
_educ3	-0.0235	0.1222	0.0369	0.8477
_alc1	0.0153	0.1222	0.0157	0.9004
_alc2	0.1027	0.1025	1.0045	0.3162
_alc3	0.2165	0.1139	3.6098	0.0574
_alc4	0.3288	0.0947	11.1054	0.0009
_amt1	0.1383	0.0755	3.3583	0.0669
_amt2	0.4085	0.1078	14.3527	0.0002
_amt3	0.7389	0.1609	21.0828	<.0001
_strtl1	0.0703	0.0782	0.8075	0.3689
_strtl2	0.1762	0.0940	3.5096	0.0610
_frst1	0.0133	0.0853	0.0244	0.8759
_frst2	0.3182	0.0952	11.1830	0.0008
_frst3	0.5056	0.1076	22.0661	<.0001
_nonc	-0.1219	0.1404	0.7536	0.3853
_prem1	-0.1569	0.1661	0.8924	0.3448
_prem2	-0.4247	0.3122	1.8507	0.1737
_quit1	0.1473	0.0859	2.9424	0.0863

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cascade.lst

_quit2	1	0.2433	0.0889	7.4867	0.0062
_want1	1	-0.0563	0.1134	0.2463	0.6197
_want2	1	-0.0445	0.1000	0.1978	0.6565
_want3	1	-0.00701	0.1018	0.0047	0.9451
_nums	1	-0.1499	0.0645	5.4043	0.0201
_white	1	0.0397	0.0834	0.2264	0.6342
_pink	1	0.0581	0.0898	0.4189	0.5175
_none	1	-0.2351	0.1829	1.6519	0.1987

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
COMMIT	1.014	0.896	1.147
_age1	1.040	0.887	1.220
_age2	1.116	0.927	1.342
_age3	1.608	1.321	1.957
_race1	0.859	0.657	1.124
_race2	1.047	0.811	1.353
_race3	1.009	0.803	1.267
_race4	0.769	0.459	1.289
_race5	0.820	0.483	1.751
_race6	1.335	0.505	3.528
_inc1	0.871	0.872	1.000
_inc2	1.290	0.959	1.736
_inc3	1.530	1.130	2.072
_educ1	0.931	0.806	1.218
_educ2	0.820	0.756	1.120
_educ3	0.777	0.769	1.000
_alc1	1.015	0.799	1.290
_alc2	1.108	0.907	1.355
_alc3	1.042	0.993	1.092
_alc4	1.389	1.145	1.686
_amt1	1.148	0.990	1.331
_amt2	1.505	1.218	1.859
_amt3	1.004	1.527	2.838
_strt1	1.073	0.920	1.250
_strt2	1.193	0.922	1.654
_frst1	1.113	0.857	1.458
_frst2	1.375	1.041	1.811
_frst3	1.658	1.343	2.047
_none	0.885	0.822	0.958
_prem1	0.855	0.617	1.188
_prem2	0.554	0.355	1.206
_quit1	1.159	0.979	1.379
_quit2	1.275	1.071	1.518
_want1	0.945	0.757	1.180
_want2	0.957	0.786	1.164
_want3	0.993	0.813	1.212
_nums	0.861	0.759	0.977
_white	1.041	0.884	1.223
_pink	1.060	0.889	1.266
_none	0.791	0.552	1.131

Association of Predicted Probabilities and Observed Responses

Percent Concordant	63.0	Somers's d	0.268
Percent Discordant	36.3	Gamma	0.269
Percent Tied	0.7	Tau-a	0.097
Pairs	6202170	c	0.634

52614 0926

# **cascade.sas**

```
options nomtterr ls=128 formdlm='' source2;
```

```
%let main= %str(commit
    _age1 _age2 _age3
    _race1 _race2 _race3 _race4 _race5 _race6
    _inc1 _inc2 _inc3
    _educ1 _educ2 _educ3
    _alc1 _alc2 _alc3 _alc4
    _amt1 _amt2 _amt3
    _str1 _str2
    _frst1 _frst2 _frst3
    _nonc
    _pre1 _pre2
    _quit1 _quit2
    _want1 _want2 _want3
    _nums);

%let state=%str(ca on ia ma nj nm ny1 ny2 nc or);
%let occp=%str(_white _pink _none);

%let interact= %str(
    whiteXcommit
    pinkXcommit
    %str(%commit));
%let interactwantto=%str(
    whiteXcommit
    want2Xcommit
    %str(%commit));

proc sort data = d001103.endpoint_1988 out = commit_88;
    by comcode seq_id member;
run;
proc sort data = d001103.endpoint_1993 out = commit_93;
    by comcode seq_id member;
run;

data commit;
    merge commit_88 (in=in1)
          commit_93 (rename = brand88_b in=in2);
    by comcode seq_id member;
    if in1 = 1 then merge_ = 1;
    if in2 = 1 then merge_ = 2;
    if in1 = 1 and in2 = 1 then merge_ = 3;
run;

%include 'Argument8893data.sas';

proc freq data=temp1;
    tables quitcig;
run cancel;

data temp1;
    set temp1;
    one1 = 1;
run;

proc logistic data=temp1;
    model quitcig = one / noint;
run cancel;

proc logistic data=temp1;
    model quitcig = _sex &main;
    output out=new PREDICTED=PREDICTED;
run;

proc logistic data=temp1;
    where sex=1;
    model quitcig = &main;
run;

proc logistic data=temp1;
    where sex=1 and _blue=1;
    model quitcig = &main;
run;

proc logistic data=temp1;
    where sex=1 and _blue=1 and educdetz <= 2;
    model quitcig = commit
        _age1 _age2 _age3
        _race1 _race2 _race3 _race4 _race5 _race6
        _inc1 _inc2 _inc3
```

title 'Men and Women No Profession';

title 'Men, No Profession';

title 'Men and Blue Collar';

title 'Men and Blue Collar and No College';

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cascade.sas

```

      _educ1
      _alc1 _alc2 _alc3 _alc4
      _amt1 _amt2 _amt3
      _strt1 _strt2
      _frst1 _frst2 _frst3
      _none
      _pre1 _pre2
      _quit1 _quit2
      _want1 _want2 _want3
      _nums ;

run;

;
proc logistic data=templ;
  where sex=1 and blues=1 and educdets <= 3 ;
  model quitcig = commit
    _age1 _age2 _age3
    _race1 _race2 _race3 _race4 _race5 _race6
    _inc1 _inc2 _inc3
    _educ1 _educ2
    _alc1 _alc2 _alc3 _alc4
    _amt1 _amt2 _amt3
    _strt1 _strt2
    _frst1 _frst2 _frst3
    _none
    _pre1 _pre2
    _quit1 _quit2
    _want1 _want2 _want3
    _nums ;

run;

proc logistic data=templ;
  model quitcig = _sex &main &occup ;

run;

proc logistic data=templ;
  where sex=1;
  model quitcig = &main &occup ;

run;

endsas;
```

title 'Men and Blue Collar and Less Than College Graduate'

title 'Men and Women (Occupation)';

title 'Men (Occupation)';

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14

table.lst

The afterCount used in the Logistic Regression

community	
Hayward	537
Vallejo	550
Peterborough	695
Brantford	754
Cedar Rapids	684
Davenport	661
Lowell	601
Fitchburg/Leominster	558
Patterson	450
Trenton	526
Las Cruces	628
Sante Fe	612
Yonkers	569
New Rochelle	620
Utica	673
Binghamton/Johnson City	620
Greensboro	612
Raleigh	638
Medford/Ashland	597
Albany/Cornwall	615
Bellingham	597
Longview/Blaine	618

*n (non-Quintile)*

$\Sigma = 13,413$

The replication of the Cummings 1.8%

commit	percent
control	10194 0.246703
treatment	10153 0.264726

The Percentages that Go Into the Logistic Regression

COMCODE	commit	weighted percent
1.00	control	0.272804
2.00	treatment	0.242963
3.00	control	0.237084
4.00	treatment	0.226749
5.00	treatment	0.257236
6.00	control	0.214855
7.00	control	0.285627
8.00	treatment	0.285905
9.00	treatment	0.289748
10.00	control	0.281444
11.00	control	0.262309
12.00	treatment	0.286452
13.00	treatment	0.31139
14.00	control	0.279933
15.00	treatment	0.288603
16.00	control	0.228078
17.00	control	0.212261
18.00	treatment	0.269125
19.00	treatment	0.216584
20.00	control	0.225494
21.00	treatment	0.23723
22.00	control	0.21384

HUMPHREY

*P3*  
*9/20/72*  
*See Table 2, p. 1*

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# table.sas

title 'Our equivalent replication of Table 1 (not having imputed data)';

```
data endpoint1993;
  set end1993.endpnt;
  commit=(comcode in (2 4 5 8 9 12 13 15 18 19 21));
  if comcode in (1 2) then pair=1;
  if comcode in (3 4) then pair=2;
  if comcode in (5 6) then pair=3;
  if comcode in (7 8) then pair=4;
  if comcode in (9 10) then pair=5;
  if comcode in (11 12) then pair=6;
  if comcode in (13 14) then pair=7;
  if comcode in (15 16) then pair=8;
  if comcode in (17 18) then pair=9;
  if comcode in (19 20) then pair=10;
  if comcode in (21 22) then pair=11;
  if (status93=0) then _status93=.;
  if (status93=1) then _status93=0;
  if (status93=-1) then _status93=1;
run;

proc sql;
  title 'The afterCount used in the Logistic Regression';
  select comcode, sum(1) from d001103.endpoint_1993
  group by comcode;

  create table weights as
  select comcode, commit, sum( intrstat=1 and statextb in (1,2,3) ) as all,
  sum( intrstat=1 and statextb in (1) ) as heavy from
  (select a.comcode, a.seq_id, a.member, a.statextb, b.intrstat, b.statexta,
  case
    when a.comcode in (2,4,5,8,9,12,13,15,18,19,21) then 1
    else 0
  end as commit
  from end1988.base88_d a left join end1988.base88_2 b
  on a.comcode=b.comcode and a.seq_id=b.seq_id and a.member=b.member)
  group by comcode, commit;
quit;

data weights (keep=weight comcode commit statbas);
  set weights;
  hweight=heavy/all; weight=1-hweight;
  format statbas statbas.;
  weight=weight; statbas=1; output;
  weight=weight; statbas=2; output;
run;

proc sql;
  create table wweight as
  select a.comcode,
  a.commit format=commit,
  a.statbas format=statbas,
  count(*) as count,
  mean(_status93) as percent
  from endpoint1993 as a
  group by comcode, commit, statbas;

  create table _table_ as
  select comcode, commit, sum(count) as count, sum(_weightedPercent) as weightedPercent
  from ( select a.comcode, b.weight, a.percent*b.weight as _weightedPercent
  from wweight as a,
  weights as b
  where a.comcode=b.comcode and a.commit=b.commit and a.statbas=b.statbas )
  group by comcode, commit;

  title 'The replication of the Cummings 1.8%';
  select commit format=commit_., sum(count), mean(weightedPercent) as percent
  from _table_
  group by commit;

  title 'The Percentages That Go Into the Logistic Regression';
  select comcode, commit, weightedPercent from _table_;
quit;
```

52614 0930



# logisticRegression.lst

InterventionCity Crossed with Time Crossed with State - 12/19/94  
Intervention is Interaction of InterventionCity and Time

## The LOGISTIC Procedure

### Model Information

Data Set WORK.BEFOREAFTER  
Response Variable (Events) Events  
Response Variable (Trials) Trials  
Number of Observations 44  
Link Function Logit  
Optimization Technique Fisher's scoring

### Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	40206
2	Nonevent	105209

### Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

### Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	171477.98	17087.40
SC	171487.87	17101.02
-2 Log L	171475.98	17084.80

### Testing Global Null Hypothesis: $H_0: \beta = 0$

Test	Chi-Square	df	Pr > ChiSq
Likelihood Ratio	629.3840	13	<.0001
Score	621.4195	13	<.0001
Wald	617.0955	13	<.0001

### Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8611	0.0201	1842.3951	<.0001
ca	1	-0.1190	0.0273	19.0379	<.0001
on	1	-0.2962	0.0277	114.3997	<.0001
ia	1	-0.0667	0.0270	6.1201	0.0134
ma	1	-0.1472	0.0273	29.0393	<.0001
nj	1	-0.4348	0.0285	232.3970	<.0001
nm	1	0.1282	0.0265	23.3621	<.0001
ny1	1	-0.0791	0.0271	8.5326	0.0035
ny2	1	-0.1683	0.0273	37.9695	<.0001
nc	1	-0.1104	0.0272	16.5336	<.0001
or	1	-0.0193	0.0269	0.5124	0.4741
time	1	-0.1495	0.0297	25.3590	<.0001
InterventionCity	1	0.0499	0.0123	16.4778	<.0001
intervention	1	0.0436	0.0416	1.0987	0.2946

### Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
ca	0.888	0.842 0.937
on	0.744	0.704 0.785
ia	0.935	0.887 0.986
ma	0.863	0.818 0.911
nj	0.647	0.612 0.685
nm	1.137	1.079 1.197
ny1	0.924	0.876 0.974
ny2	0.845	0.801 0.892
nc	0.895	0.849 0.944
or	0.981	0.931 1.034
time	0.861	0.812 0.913
InterventionCity	1.051	1.026 1.077
intervention	1.045	0.963 1.133

City Name

QR

Time

1=after  
0=before

Intervention City  
1=Intervention  
0=Control

{ca, on, ..., DR}

= Time \* Intervention City

was p.3 to 8

11/17

52614 0931

3

Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.6	Somers' D	0.084
Percent Discordant	43.2	Gamma	0.089
Percent Tied	5.2	Tau-a	0.034
Pairs	4230033054	c	0.542

produced by R.JRTC  
in  
HUMPHREY

# logisticRegression.lst

InterventionCity is the interaction effect since the analysis is conducted separately for each time period  
~~InterventionCity is crossed with Center~~  
 Shows before the intervention study

The LOGISTIC Procedure

## Model Information

Data Set WORK.BEFOREAFTER  
 Response Variable (Events) Events  
 Response Variable (Trials) Trials  
 Number of Observations 22  
 Link Function Logit  
 Optimization Technique Fisher's scoring

## Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	36792
2	No event	95208

## Model Convergence Status

convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	156223.28	155563.67
SC	156233.07	155704.42
-2 log l	156221.28	155562.67

## Testing Global Null Hypothesis: $BETA=0$

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	658.3382	11	<.0001
Score	648.5437	11	<.0001
Wald	643.0361	11	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8369	0.0207	1629.0151	<.0001
ca	1	-0.1451	0.0284	26.0814	<.0001
on	1	-0.3272	0.0291	126.6961	<.0001
ia	1	-0.0763	0.0282	7.3216	0.0068
ma	1	-0.1904	0.0286	44.4604	<.0001
nj	1	-0.5009	0.0298	291.8245	<.0001
nm	1	0.1172	0.0277	17.9264	<.0001
ny1	1	-0.1203	0.0283	18.0262	<.0001
ny2	1	-0.2006	0.0286	49.2328	<.0001
nc	1	-0.1277	0.0284	20.2831	<.0001
or	1	-0.0189	0.0280	0.4526	0.5011
InterventionCity	1	0.0500	0.0123	16.4916	<.0001

## Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
ca	0.865	0.818	0.914
on	0.721	0.681	0.763
ia	0.927	0.877	0.979
ma	0.827	0.782	0.874
nj	0.606	0.572	0.642
nm	1.124	1.065	1.187
ny1	0.897	0.839	0.937
ny2	0.818	0.774	0.865
nc	0.880	0.833	0.930
or	0.981	0.929	1.037
InterventionCity	1.051	1.026	1.077

new? p. 3 fn 8a

= EXP(0.0500)

52614 0933

# logisticRegression.lst

Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.2	Somers' D	0.087
Percent Discordant	42.6	Gamma	0.093
Percent Tied	6.2	Tau-a	0.035
Pairs	3502892736	c	0.543

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in  
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52614 0934

# logisticRegression.lst

(InterventionCity Crossed with Time) Nested Within State

The LOGISTIC Procedure

## Model Information

Data Set	WORK.BEFOREAFTER
Response Variable (Events)	Events
Response Variable (Trials)	Trials
Number of Observations	44
Link Function	Logit
Optimization Technique	Fisher's scoring

## Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	40206
2	No event	105209

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	171477.98	170851.9
SC	171487.87	171071.9
-2 Log L	171475.98	170803.95

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	Df	Pr > ChiSq
Likelihood Ratio	670.0338	22	<.0001
Score	670.0338	22	<.0001
Wald	657.1045	22	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8360	0.0191	1921.0310	<.0001
ca	1	-0.0321	0.0336	13.1810	0.0003
on	1	-0.0331	0.0340	43.9617	<.0001
ia	1	-0.1165	0.0334	12.1519	0.0005
ma	1	-0.0338	0.0338	27.9818	<.0001
nj	1	-0.5940	0.0353	124.7281	<.0001
nm	1	-0.0327	0.0327	3.2808	0.0701
ny1	1	-0.0714	0.0333	4.6111	0.0318
ny2	1	-0.1880	0.0339	30.8185	<.0001
nc	1	-0.1904	0.0339	31.5794	<.0001
or	1	-0.0388	0.0331	1.3697	0.2419
time	1	-0.1589	0.0296	28.8332	<.0001
ca*InterventionCity	1	0.00638	0.0393	0.0264	0.8710
on*InterventionCity	1	-0.1436	0.0406	12.5396	0.0004
ia*InterventionCity	1	0.0983	0.0385	6.5063	0.0107
ma*InterventionCity	1	-0.0632	0.0394	2.5691	0.1090
nj*InterventionCity	1	-0.0830	0.0427	3.7808	0.0518
nm*InterventionCity	1	0.1365	0.0373	13.4162	0.0002
ny1*InterventionCity	1	-0.0155	0.0388	0.1505	0.6987
ny2*InterventionCity	1	0.0391	0.0395	0.9810	0.3220
nc*InterventionCity	1	0.1569	0.0390	16.1409	<.0001
or*InterventionCity	1	0.0388	0.0383	1.0287	0.3165
Intervention	1	0.0621	0.0414	2.2469	0.1339

## Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
time	0.85	0.805 0.904
intervention	1.064	0.941 1.164

Association of Predicted Probabilities and Observed Responses

BEST IMAGE

52614 0935

logisticRegression.lst



Percent Concordant	51.0	Somers' D	0.085
Percent Discordant	42.5	Gamma	0.091
Percent Tied	6.5	Tau-a	0.034
Pairs	4230033054	c	0.542

# produced by RJRTC in HUMPHREY

52614 0936

# logisticRegression.lst

InterventionCity is the interaction affect since the analysis is conducted separately for each time period  
InterventionCity is Nested in State  
Shows before the intervention study

The LOGISTIC Procedure

## Model Information

Data Set<sup>1</sup> WORK.BEFOREAFTER  
Response Variable (Events) Events  
Response Variable (Trials) Trials  
Number of Observations 22  
Link Function Logit  
Optimization Technique Fisher's scoring

## Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	16792
2	Nonevent	95208

## Model Convergence Status

Convergence criterion (GCONV=8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	156223.28	155567.57
SC	156233.07	155713.17
-2 Log L	156221.28	155557.17

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	695.7591	20	<.0001
Score	686.0739	20	<.0001
Wald	679.6098	20	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8411	0.0198	1684.1342	<.0001
ca	1	-0.1576	0.0350	20.2305	<.0001
on	1	-0.2556	0.0356	51.3593	<.0001
ia	1	-0.1217	0.0348	12.4031	0.0004
ma	1	-0.2289	0.0354	41.7517	<.0001
nj	1	-0.4595	0.0370	154.6160	<.0001
nm	1	0.0442	0.0341	1.6861	0.1941
ny1	1	-0.1080	0.0348	9.6393	0.0019
ny2	1	-0.2083	0.0353	34.7974	<.0001
nc	1	-0.2032	0.0353	33.1600	<.0001
or	1	-0.0450	0.0345	1.7052	0.1916
caInterventionCity	1	0.0249	0.0408	0.3741	0.5408
onInterventionCity	1	-0.1470	0.0426	11.8858	0.0006
iaInterventionCity	1	0.0920	0.0402	5.2426	0.0220
maInterventionCity	1	0.0764	0.0412	3.4360	0.0638
njInterventionCity	1	-0.0836	0.0447	3.4977	0.0615
nmInterventionCity	1	0.1442	0.0388	13.8352	0.0002
ny1InterventionCity	1	-0.0247	0.0406	0.3700	0.5430
ny2InterventionCity	1	0.0153	0.0413	0.1381	0.7102
ncInterventionCity	1	0.1446	0.0407	13.3541	0.0003
orInterventionCity	1	0.0520	0.0397	1.7173	0.1900

## Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits
ca	0.454	0.338 0.615
on	0.775	0.623 0.961
ia	0.885	0.626 1.247
ma	0.795	0.642 0.983

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logisticRegression.lst

nj	0.632	0.587	0.679
nm	1.045	0.978	1.117
ny1	0.898	0.839	0.961
ny2	0.812	0.758	0.870
nc	0.816	0.762	0.875
or	0.956	0.894	1.023
caInterventionCity	1.025	0.947	1.111
onInterventionCity	0.863	0.794	0.939
laInterventionCity	1.096	1.013	1.186
maInterventionCity	1.079	0.996	1.170
njInterventionCity	0.920	0.843	1.004
nmInterventionCity	1.155	1.071	1.246
ny1InterventionCity	0.976	0.901	1.056
ny2InterventionCity	1.015	0.937	1.101
ncInterventionCity	1.160	1.071	1.256
orInterventionCity	1.053	0.975	1.139

Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.7	Somers' D	0.088
Percent Discordant	42.9	Gamma	0.093
Percent Tied	5.4	Tau-a	0.035
Pairs	3502892736	C	0.544

produced by R.JR  
in  
HUMPHREY



# logisticRegression.sas

```
options formdlim=' ' ls=128;
data BeforeAfter;
  informat commit $9.;
  infile cards;
  input comcode commit $ after before aftercount;
```

```
cards:
1.00 control 0.272804 .275 537
2.00 treatment 0.242963 .280 550
3.00 control 0.237084 .256 695
4.00 treatment 0.226749 .229 754
5.00 treatment 0.257236 .301 684
6.00 control 0.214855 .282 661
7.00 control 0.285627 .261 601
8.00 treatment 0.285905 .276 558
9.00 treatment 0.289748 .205 450
10.00 control 0.281444 .219 526
11.00 control 0.262309 .317 628
12.00 treatment 0.286452 .349 612
13.00 treatment 0.31139 .280 569
14.00 control 0.279933 .285 620
15.00 treatment 0.288603 .268 673
16.00 control 0.228078 .265 620
17.00 control 0.212261 .266 612
18.00 treatment 0.269325 .296 638
19.00 treatment 0.216984 .309 597
20.00 treatment 0.225494 .288 615
21.00 treatment 0.2372 .328 597
22.00 control 0.21384 .287 618
```

```
%let state=1str(ca on ia ma nj nm ny1 ny2 nc or);
%let _2way_ = 1str(ca*InterventionCity on*InterventionCity ia*InterventionCity ma*InterventionCity nj*InterventionCity
nm*InterventionCity ny1*InterventionCity ny2*InterventionCity nc*InterventionCity or*InterventionCity
ca*time on*time ia*time ma*time nj*time nm*time ny1*time ny2*time nc*time or*time );
%let _2way_t = 1str(ca*InterventionCity*time on*InterventionCity*time ia*InterventionCity*time ma*InterventionCity*time
nm*InterventionCity*time ny1*InterventionCity*time ny2*InterventionCity*time nc*InterventionCity*time );
%let _3way_ = 1str( ca*InterventionCity*time on*InterventionCity*time ia*InterventionCity*time
ma*InterventionCity*time nj*InterventionCity*time nm*InterventionCity*time
ny1*InterventionCity*time ny2*InterventionCity*time nc*InterventionCity*time);
```

```
data BeforeAfter;
  informat commit $9.;
  array _state ca on ia ma nj nm ny1 ny2 nc or wa;
  do over _state;
    _state=0;
```

```
  one;
  select (comcode);
    when(1) ca =1; when(2) on =1;
    when(3) on =1; when(4) on =1;
    when(5) ia =1; when(6) ia =1;
    when(7) ma =1; when(8) ma =1;
    when(9) nj =1; when(10) nj =1;
    when(11) nm =1; when(12) nm =1;
    when(13) ny1=1; when(14) ny1=1;
    when(15) ny2=1; when(16) ny2=1;
    when(17) nc =1; when(18) nc =1;
    when(19) or =1; when(20) or =1;
    when(21) wa =1; when(22) wa =1;
    otherwise;
```

```
  end;
  InterventionCity=(commit='treatment');
  state=round(comcode/2);
  time=0;
  quitrate=before;
  intervention=0;
  Events=round(6000*before);
  Trials=6000;
  output;
  time=1;
  Trials=afterCount;
  events=round(aftercount*after);
  quitrate=after;
  intervention=(commit='treatment');
  output;
  drop before after commit aftercount;
```

run;

```
proc sort data=BeforeAfter;
  by time;
run;
```

```
proc logistic data=BeforeAfter;
  model events trials= 1state time InterventionCity intervention ;
```

Title 'InterventionCity Crossed with Time Crossed with State ';

title2 'Intervention is Interaction of InterventionCity and Time';

52614 0939

# logisticRegression.sas

run;

;

```
proc logistic data=BeforeAfter;
  where time=0;
  model events/trials= &state InterventionCity;
```

run;

title1 'InterventionCity is the interaction affect since the analysis is'

title2 'conducted separately for each time period';

title3 'InterventionCity is Crossed with State';

title4 'Shows before the intervention study';

Title '(InterventionCity Crossed with Time) Nested Within State ';

title2;

title3;

title4;

```
proc logistic data=BeforeAfter;
  model events/trials= &state time &_2way_t intervention ;
```

run;

data beforeafter;

beforeafter;

caInterventionCity = ca\*InterventionCity;

onInterventionCity = on\*InterventionCity;

iaInterventionCity = ia\*InterventionCity;

maInterventionCity = ma\*InterventionCity;

njInterventionCity = nj\*InterventionCity;

nmInterventionCity = nm\*InterventionCity;

ny1InterventionCity= ny1\*InterventionCity;

ny2InterventionCity= ny2\*InterventionCity;

ncInterventionCity = nc\*InterventionCity;

orInterventionCity = or\*InterventionCity;

run;

;

title1 'InterventionCity is the interaction affect since the analysis is'

title2 'conducted separately for each time period';

title3 'InterventionCity is Nested in State';

title4 'Shows before the intervention study';

```
proc logistic data=BeforeAfter;
```

where time=0;

model events/trials=

&state

caInterventionCity

onInterventionCity

iaInterventionCity

maInterventionCity

njInterventionCity

nmInterventionCity

ny1InterventionCity

ny2InterventionCity

ncInterventionCity

orInterventionCity ;

run;

produced by R in HUGO



$$S_{\text{chem}} = \text{light} + \text{humid} + \text{weights}$$

$$\text{light} \rightarrow \text{red1};$$

$$\text{humid} \rightarrow \text{red2};$$

$$\text{weights} \rightarrow \text{red3};$$

# produced by RJRTC in

## HUMPHREY

sas.siffip

```
data psmad2;
set psmad;
array diffs (11) temp01 - temp11;
array temps (11) temp01 - temp11;
do i1 = 0 to 1;
do i2 = 0 to 1;
do i3 = 0 to 1;
do i4 = 0 to 1;
do i5 = 0 to 1;
do i6 = 0 to 1;
do i7 = 0 to 1;
do i8 = 0 to 1;
do i9 = 0 to 1;
do i10 = 0 to 1;
do i11 = 0 to 1;
if i1 = 0 then temps(1) = diffs(1);
if i2 = 0 then temps(2) = diffs(2);
if i3 = 0 then temps(3) = diffs(3);
if i4 = 0 then temps(4) = diffs(4);
if i5 = 0 then temps(5) = diffs(5);
if i6 = 0 then temps(6) = diffs(6);
if i7 = 0 then temps(7) = diffs(7);
if i8 = 0 then temps(8) = diffs(8);
if i9 = 0 then temps(9) = diffs(9);
if i10 = 0 then temps(10) = diffs(10);
if i11 = 0 then temps(11) = diffs(11);
else temps(1) = diffs(1);
else temps(2) = diffs(2);
else temps(3) = diffs(3);
else temps(4) = diffs(4);
else temps(5) = diffs(5);
else temps(6) = diffs(6);
else temps(7) = diffs(7);
else temps(8) = diffs(8);
else temps(9) = diffs(9);
else temps(10) = diffs(10);
else temps(11) = diffs(11);
run;
```

52614 0943

## Quit Rates for 1m smokers

Obs	CONCODE	CONMIT	N	quitrate
1	Wayward	comparison	519	0.302
2	Vallejo	intervention	504	0.291
3	Peterborough	comparison	453	0.268
4	Branford	intervention	475	0.293
5	Davenport	comparison	448	0.255
6	Cedar Rapids	intervention	443	0.321
7	Lowell	comparison	475	0.307
8	Fitchburg/Leeminster	intervention	463	0.340
9	Trenton	comparison	472	0.333
10	Patterson	intervention	473	0.332
11	Las Cruces	comparison	482	0.293
12	Santa Fe	intervention	470	0.319
13	New Rochelle	comparison	475	0.306
14	Yonkers	intervention	463	0.340
15	Birmingham/Johanson City	comparison	464	0.264
16	Utica	intervention	473	0.339
17	Greensboro	comparison	456	0.262
18	Raleigh	intervention	492	0.297
19	Albany/Corvallis	comparison	467	0.259
20	Medford/Ashland	intervention	479	0.256
21	Longview/Kelso	comparison	440	0.225
22	Bellingham	intervention	442	0.276

## Quit Rates for h smokers

Obs	CONCODE	CONMIT	N	quitrate
1	Wayward	comparison	435	0.212
2	Vallejo	intervention	442	0.144
3	Peterborough	comparison	489	0.207
4	Branford	intervention	531	0.167
5	Davenport	comparison	464	0.162
6	Cedar Rapids	intervention	475	0.175
7	Lowell	comparison	497	0.259
8	Fitchburg/Leeminster	intervention	428	0.212
9	Trenton	comparison	458	0.165
10	Patterson	intervention	440	0.181
11	Las Cruces	comparison	454	0.188
12	Santa Fe	intervention	450	0.171
13	New Rochelle	comparison	451	0.229
14	Yonkers	intervention	432	0.256
15	Birmingham/Johanson City	comparison	434	0.171
16	Utica	intervention	455	0.210
17	Greensboro	comparison	462	0.127
18	Raleigh	intervention	455	0.217
19	Albany/Corvallis	comparison	451	0.198
20	Medford/Ashland	intervention	426	0.142
21	Longview/Kelso	comparison	448	0.197
22	Bellingham	intervention	442	0.158

Combined Quit Rates after controlling for pre-88 differences

## The MEANS Procedure

Variable	Mean
comparison	0.2467027
intervention	0.2547260

P-value:

52614 0944

NEW 3, p.3 fmg

Obs  
519  
0.18

Produced by RRTC

in

$$\Delta = \Delta - \Delta'$$

HUMPHREY

Tugboat / Vallejo sample

$$\Delta = \Delta - 0.5$$

$$\Delta = \Delta - 0.5$$

Monahan 6, p 21

```

*** run;
options mprint ls=111 ps=45 compress=yes nocenter nodate nonumber source2 mlogic; *** screen
spes ***;
options noferr mprint ls=225 ps=80 formatlim = "compressyes nocenter nodate nonumber source2";
***;
options noprnt ps=100 ls=132 compress=yes nocenter nodate nonumber source2 mlogic; *** wide6
***;
proc sort data=sashelp.names by name;
run;

libname d001103 "/data05/rjrfallise/COWITT/D001103";
libname end1988 "/data05/rjrfallise/COWITT/D001103/1988_Endpoint_Cohort";
libname eval1989 "/data05/rjrfallise/COWITT/D001103/1989_Evaluation_Cohort";
libname eval1991 "/data05/rjrfallise/COWITT/D001103/1991_Evaluation_Cohort";
libname end1993 "/data05/rjrfallise/COWITT/D001103/1993_Endpoint_Cohort";
libname eval1993 "/data05/rjrfallise/COWITT/D001103/1993_Evaluation_Cohort";
libname prev1993 "/data05/rjrfallise/COWITT/D001103/1993_Prevalence_Survey";

%include '/data05/rjrfallise/COWITT/D001103/commit_endpoint_cohort_data_1988.sasprg';

proc sort data=end1993 endpoint out=endptq3;
by comcode seq_id member;
run;

proc sort data=d001103.endpoint_1988(keep=comcode commit) out=cowittprev;
by comcode;
out=detail;
by comcode seq_id member;
run;

proc sort data=end1988.base88_d(keep=comcode seq_id member statentb);
by comcode seq_id member;
out=desc2;
run;

proc sort data=end1988.base88_2(keep=comcode seq_id member intrstatl statenta sex);
by comcode seq_id member;
run;

data endptq3;
merge endptq3 (in=a keep=seq_id comcode member status status93)
desc2 (in=b keep=comcode seq_id member sex);
by comcode seq_id member;
if a=1;

data prev;
merge
detail(in=in1)
desc2(in=in2);
by comcode seq_id member;
if in1;
- if sex = 1;
citypair = round(comcode/2);
select(comcode);
when(2,4,5,6,9,12,13,15,18,19,21) commit=1;
otherwise commit=0;
run;

proc freq data=prev noprint;
where (intrat=1 & statentb in (1,2,3));
tables citypair*commit / out=out3a(drop=percent);
run;

proc freq data=prev noprint;
where (intrat=1 & statentb in (1));
tables citypair*commit / out=out3b(drop=percent);
run;

data weights;
merge
out3a(rename=count=n)
out3b(rename=count=q);
by citypair commit;
if count=0 then control=q/n;
if count=1 then treatment=q/n;
if last.citypair then do;
std_avgmean(control,treatment);
output;
end;
retain control treatment;
drop q n;
run;

comparison = c_j*(control+c_lm*(1-control));

weights;
by citypair;
quitrate = diff_q/dose;
var quitrate;
format quitrate 5.3;
title 'Quit Ratios for Dose smokers';

proc transpose data = diff_qdose
out = diff_qdose (rename = (coll = control coll2 = treatment));
var quitrate;
by citypair;
run;

band;

eqratio(lm,0);
eqr(tratio(h,1));

** Next, p-val and CI:

data diff_pre88;
input citypair treatment control;
diff_pre=treatment-control;
cards;
1 .280 .275
2 .229 .256
3 .301 .282
4 .275 .261
5 .205 .219
6 .349 .317
7 .280 .285
8 .288 .265
9 .296 .266
10 .309 .298
11 .328 .287
;
run;

data diff;
merge
diff_pre88
diff_lm(rename=(treatment-t_lm
control=c_lm))
diff_h(rename=(treatment-t_h
control=c_h));
weights;
by citypair;
comparision = c_j*(control+c_lm*(1-control));
```

TABLE 3. Histograms





diff18\_male\_1st

(men only)

like p. 1, but men only

p. 2, fn 4

pval  
0.17

Quit Rates for 1st smokers

Obs	COCODE	COMMIT	N	quitrate
1	Wayward	comparison	245	0.220
2	Vallejo	intervention	257	0.162
3	Peterborough	comparison	243	0.200
4	Brantford	intervention	300	0.186
5	Davenport	comparison	248	0.172
6	Cedar Rapids	intervention	269	0.177
7	Lowell	comparison	268	0.269
8	Fitchburg/Leominster	intervention	243	0.223
9	Trenton	comparison	253	0.162
10	Patterson	intervention	245	0.175
11	Las Cruces	comparison	266	0.185
12	Santa Fe	intervention	264	0.177
13	New Rochelle	comparison	217	0.236
14	Yonkers	intervention	229	0.200
15	Binghamton/Johnson City	comparison	236	0.200
16	Utica	intervention	258	0.253
17	Greensboro	comparison	261	0.138
18	Raleigh	intervention	276	0.204
19	Albany/Corvallis	comparison	236	0.210
20	Medford/Ashland	intervention	246	0.146
21	Longview/Kelso	comparison	258	0.218
22	Bellingham	intervention	270	0.136

Quit Rates for 2nd smokers

Obs	COCODE	COMMIT	N	quitrate
1	Wayward	comparison	245	0.220
2	Vallejo	intervention	257	0.162
3	Peterborough	comparison	243	0.200
4	Brantford	intervention	300	0.186
5	Davenport	comparison	248	0.172
6	Cedar Rapids	intervention	269	0.177
7	Lowell	comparison	268	0.269
8	Fitchburg/Leominster	intervention	243	0.223
9	Trenton	comparison	253	0.162
10	Patterson	intervention	245	0.175
11	Las Cruces	comparison	266	0.185
12	Santa Fe	intervention	264	0.177
13	New Rochelle	comparison	217	0.236
14	Yonkers	intervention	229	0.200
15	Binghamton/Johnson City	comparison	236	0.200
16	Utica	intervention	258	0.253
17	Greensboro	comparison	261	0.138
18	Raleigh	intervention	276	0.204
19	Albany/Corvallis	comparison	236	0.210
20	Medford/Ashland	intervention	246	0.146
21	Longview/Kelso	comparison	258	0.218
22	Bellingham	intervention	270	0.136

Combined Quit Rates

The MEANS Procedure

Variable	Mean
comparison	0.24595906
intervention	0.1622670

p-value:

52614 0947





diff81C.BC.lst

(Blue collar men only)

Quit Rates for 1m smokers

Obs	CONCODE	COMMIT	N	quitrate
1	Hayward	comparison	122	0.275
2	Vallejo	intervention	104	0.265
3	Peterborough	comparison	107	0.160
4	Brantford	intervention	109	0.259
5	Davenport	comparison	86	0.271
6	Cedar Rapids	intervention	97	0.275
7	Lowell	comparison	108	0.328
8	Fitchburg/Lewinster	intervention	92	0.456
9	Trenton	comparison	120	0.383
10	Patterson	intervention	148	0.301
11	Las Cruces	comparison	93	0.241
12	Santa Fe	intervention	87	0.278
13	New Rochelle	comparison	106	0.239
14	Yonkers	intervention	92	0.316
15	Birmingham/Johnson City	comparison	88	0.300
16	Utica	intervention	87	0.268
17	Greenboro	comparison	83	0.205
18	Raleigh	intervention	70	0.313
19	Albany/Corvallis	comparison	108	0.281
20	Medford/Ashland	intervention	107	0.258
21	Longview/Kelso	comparison	111	0.217
22	Bellingham	intervention	80	0.226

Quit Rates for h smokers

Obs	CONCODE	COMMIT	N	quitrate
1	Hayward	comparison	135	0.217
2	Vallejo	intervention	116	0.120
3	Peterborough	comparison	139	0.223
4	Brantford	intervention	182	0.192
5	Davenport	comparison	123	0.174
6	Cedar Rapids	intervention	146	0.151
7	Lowell	comparison	165	0.265
8	Fitchburg/Lewinster	intervention	132	0.241
9	Trenton	comparison	149	0.123
10	Patterson	intervention	150	0.194
11	Las Cruces	comparison	78	0.208
12	Santa Fe	intervention	90	0.200
13	New Rochelle	comparison	108	0.250
14	Yonkers	intervention	108	0.257
15	Birmingham/Johnson City	comparison	138	0.208
16	Utica	intervention	133	0.206
17	Greenboro	comparison	104	0.094
18	Raleigh	intervention	80	0.156
19	Albany/Corvallis	comparison	130	0.187
20	Medford/Ashland	intervention	120	0.184
21	Longview/Kelso	comparison	167	0.193
22	Bellingham	intervention	133	0.203

Combined Quit Rates

The MEANS Procedure

Variable	Mean
comparison	0.2352987
intervention	0.2473459

p-value:

52614 0950

Produced by RJR/ATC  
in  
HUMPHREY

Obs

pval

1

0.18

```

*** drop q n;
*** screen
*** landac run;
options mprint ls=11 ps=45 compresses nocenter nodate nonumber source2 slogit;
options nofmterr ls=225 ps=80 formdlm = ' ' compresses nocenter nodate nonumber source2 slogit;
***;
***;
***;
options mprint ps=100 ls=232 compresses nocenter nodate nonumber source2 slogit;
***;
***;
***;
libname d001103 '/data05a/rjrfallise/COMMIT/001103';
libname end1988 '/data05a/rjrfallise/COMMIT/001113/1988_Endpoint_Cohort';
libname eval1989 '/data05a/rjrfallise/COMMIT/001113/1989_Evaluation_Cohort';
libname eval1991 '/data05a/rjrfallise/COMMIT/001113/1991_Evaluation_Cohort';
libname end1993 '/data05a/rjrfallise/COMMIT/001113/1993_Endpoint_Cohort';
libname eval1993 '/data05a/rjrfallise/COMMIT/001113/1993_Evaluation_Cohort';
libname prev1993 '/data05a/rjrfallise/COMMIT/001113/1993_Prevalence_Survey';
%include '/data05a/rjrfallise/COMMIT/001103/commit_endpoint_cohort_data_1988.sasprg';

proc sort data=end1993 endout=out-endnt93;
  by comcode seq_id number;
run;

proc sort data=d001103 endpoint_1988(heap=comcode commit) out=out-endnt93;
  by comcode;
run;

proc sort data=end1988 base88_d(heap=comcode seq_id number statentb occdsc);
  out=desc2;
  by comcode seq_id number;
run;

proc sort data=end1988 base88_2(heap=comcode seq_id number intrstat statentb sex);
  out=desc2;
  by comcode seq_id number;
run;

data endnt93;
  merge endnt93;
  desc2 (in = b keep = seq_id comcode number statentb status93)
  detail (in = c);
  by comcode seq_id number;
  if a = 1;
run;

data prev;
  merge
    detail(in=in1)
    desc2(in=in2);
  by comcode seq_id number;
  if in1;
  if sex = 1 and occdsc = 3;
  citypair = round(comcode/2);
  select(comcode);
  when(2,4,5,6,9,12,13,15,16,19,21) commit=1;
  otherwise
    commit=0;
  end;
run;

proc freq data=prev noprint;
  where (intrstat=1 & statentb in (1,2,3));
  tables citypair*commit / out=out3a(drop=percent);
run;

proc freq data=prev noprint;
  where (intrstat=1 & statentb in (1));
  tables citypair*commit / out=out3b(drop=percent);
run;

data weights;
  merge
    out3a(rename=countn)
    out3b(rename=countq);
  by citypair commit;
  if commit=0 then control=q/n;
  if commit=1 then treatment=q/n;
  if last.citypair then do;
    std_avg=mean(control,treatment);
    output;
  end;
  retain control treatment;
run;

proc means data = diffa mean;
  var comparison intervent;
  title 'Combined Quit Rates';
run;

%macro prevl;
data prevm;
  set diffa;
  by citypair;
  array diffa (diff01 - diff11);
  diffa(citypair) = diff;
  if citypair=1 then output;
  retain diff01 - diff11;
  keep diff01 - diff11;
run;

```



Harris Report 7 replication  
no Pleural effect  
using ms8a.lim, ms5lim.lpj

R2\_1  
G/R 1963-2000 3.0 → 1.0  
Multiple

R2\_r2  
P132  
Initial Peto Multiple 1963-2000  
0.7 → 1.0

R2\_r2  
P133  
G/R Multiple 1954-1962  
0.15 → 1.0

R2\_r2-R1-R1  
P133  
Initial Peto Multiple 1954-62  
0.9 → 1.0

see also tab 62 p.1

P.D. "probably got post  
LC claimant who got a disc  
in BL will get same o.  
in BL am never diagnosed in ef  
(aunt, #6, P15)

dataset name/  
created by

	LC	DBID	PL	
DBID	0.5033	0.0000	0.0000	0.0000
DBID	0.1397	0.7785	0.0000	0.0000
DBID	0.2139	0.1052	0.8638	0.0000
PL	0.1046	0.0440	0.0904	1.0000

ms8a.dtu/  
ms8a.lim

0.8880	0.0000	0.0000	0.0000
0.0365	0.9577	0.0000	0.0000
0.0482	0.0217	0.9754	0.0000
0.0195	0.0174	0.0160	1.0000

ms8a-R2.dtu/  
ms8a-R2.lim  
(tab 66, p. 19)

0.9467	0.0000	0.0000	0.0000
0.0177	0.9803	0.0000	0.0000
0.0229	0.0102	0.9886	0.0000
0.0090	0.0080	0.0074	1.0000

ms8a-R2-r2.dtu  
ms8a-R2-r2.lim  
(tab 67, p. 35)

0.9790	0.0000	0.0000	0.0000
0.0070	0.9923	0.0000	0.0000
0.0090	0.0040	0.9956	0.0000
0.0035	0.0031	0.0029	1.0000

ms8a-R2-r2-R1.dtu  
ms8a-R2-r2-R1.lim  
(tab 68, p. 35)

1.0000	0.0000	0.0000	0.0000
0.0000	1.0000	0.0000	0.0000
0.0000	0.0000	1.0000	0.0000
0.0000	0.0000	0.0000	1.0000

ms8a-R2-r2-R1-R1.dtu  
ms8a-R2-r2-R1-R1.lim  
(tab 69, p. 35)

produced by  
in  
HUMPHREY

Harris Report 7 Replication

H, #7, P2

Year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	.	.	.	.	.	.	.	.
1993	.	.	.	.	.	.	.	.
1994	.	.	.	.	.	.	.	.
1995	.	.	.	.	.	.	.	.
1996	460	232	18	78	50	143	41	95
1997	852	429	601	587	1165	1252	1024	1278
1998	1408	709	2386	2054	3823	3854	3811	4540
1999	2265	1140	16423	13102	24116	23044	8291	12334
2000	2960	1490	15359	12370	24575	23477	10674	14726
TOTAL	7945	4000	34787	28191	53729	51770	23841	32973
1992	14	7	1	3	0	3	0	2
1993	17	6	2	4	0	4	0	2
1994	555	279	6	82	3	122	0	59
1995	933	470	44	165	30	230	21	126
1996	1612	811	1003	1006	3356	3349	3722	4293
1997	2405	1210	4262	3654	7262	7236	5453	6783
1998	2111	1062	3967	3383	6992	6909	5907	7153
1999	2653	1335	22284	17719	35603	33666	12023	17725
2000	3685	1835	20135	16190	30318	29095	13653	18773
TOTAL	13985	7036	51704	42206	83564	80614	40779	54916
CF - BL		6947		9498		2950		

produced by RRC in HUMPHREY

BL data → P3, 4, 5, 6



Harris Report 7 Replication  
with R2 changed 3.0 to 1.0

1993-2000 AR multi-line

*Review*

*58-1*

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	.	.	.	.	.	.	.	.
1993	.	.	.	.	.	.	.	.
1994	.	.	.	.	.	.	.	.
1995	.	.	.	.	.	.	.	.
1996	460	408	18	34	50	71	41	51
1997	852	757	601	607	1165	1190	1024	1070
1998	1408	1250	2386	2336	3823	3849	3811	3941
1999	2265	2011	16423	15811	24116	23988	8291	9007
2000	2960	2628	15359	14817	24575	24446	10674	11392
TOTAL	7945	7054	34787	33605	53729	53544	23841	25461
1992	14	12	1	1	0	1	0	0
1993	17	15	2	3	0	1	0	0
1994	555	493	6	26	3	30	0	11
1995	933	825	44	76	30	75	21	40
1996	1612	1421	1003	1019	3356	3373	3722	3825
1997	2405	2136	4262	4170	7262	7292	5453	5690
1998	2111	1876	3967	3876	6992	7008	5907	6129
1999	2653	2356	22284	21438	35603	35339	12023	13032
2000	3685	3272	20135	19418	30318	30187	13653	14560
TOTAL	13985	12449	51704	50027	83564	83306	40779	43287
CF - BL		1566		1677		258		

*tab 66, p. 2*

*BL #'s : see p. 2 this tab*

**Produced by KIRK in HUMPHREY**

52614 0955

Harris Report 7 Replication  
with R2 changed 3 to 1.0  
and r2 changed 0.7 to 1.0

Initiative Reactions, 1962-2000

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	435	18	26	50	60	41	46
1997	852	807	601	604	1165	1177	1024	1046
1998	1408	1333	2386	2364	3823	3836	3811	3871
1999	2265	2144	16423	16140	24116	24060	8291	8621
2000	2960	2802	15359	15109	24575	24519	10674	11005
TOTAL	7945	7521	34787	34243	53729	53652	23841	24588
1992	14	13	1	1	0	0	0	0
1993	17	16	2	2	0	0	0	0
1994	555	525	6	16	3	16	0	5
1995	933	883	44	60	30	51	21	30
1996	1612	1526	1003	1012	3356	3365	3722	3769
1997	2405	2277	4262	4221	7262	7278	5453	5562
1998	2111	1998	3967	3926	6992	7001	5907	6009
1999	2653	2512	22284	21892	35603	35485	12023	12489
2000	3685	3444	20135	19804	30318	30262	13653	14072
TOTAL	13985	13039	51704	50934	83564	83458	40779	41936
CF - BL		746		770		106		

tab 67 p. 41

BL #'s : see p. 2 this tab

52614 0956

4

Harris Report 7 Replication  
with R2 changed 3 to 1.0  
and r2 changed 0.7 to 1.0  
and R1 changed 1.5 to 1.0

QR multiple 1954-1962

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	OF	BL	OF	BL	OF	BL	OF
1992	.	.	.	.	.	.	.	.
1993	.	.	.	.	.	.	.	.
1994	.	.	.	.	.	.	.	.
1995	.	.	.	.	.	.	.	.
1996	460	450	18	21	50	54	41	43
1997	852	834	601	602	1165	1170	1024	1032
1998	1408	1378	2386	2377	3823	3828	3811	3834
1999	2265	2217	16423	16312	24116	24096	8281	8420
2000	2960	2898	15359	15261	24575	24555	10674	10803
TOTAL	7945	7777	34787	34573	53729	53703	23841	24132
1992	14	14	1	1	0	0	0	0
1993	17	17	2	2	0	0	0	0
1994	555	543	6	10	3	8	0	2
1995	933	933	44	50	30	38	21	24
1996	1612	1578	1003	1007	3356	3360	3722	3740
1997	2405	2364	4262	4246	7262	7269	5453	5496
1998	2111	2067	3967	3951	6992	6996	5907	5947
1999	2653	2597	22284	22131	35603	35559	12023	12205
2000	3685	3608	20135	20006	30318	30298	13653	13816
TOTAL	13985	13591	51704	51404	83564	83528	40779	41230
CF-BL		294		300		36		

tab 68 p. 41

BL #'s : see p. 2 Chn tabs

52614 0957

5

Harris Report 7 Replication  
with R2 changed 3 to 1.0  
and r2 changed 0.7 to 1.0  
and R1 changed 1.5 to 1.0  
and r1 changed 0.9 to 1.0

*Initial Rtn multipler 1954-1962*

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	.	.	.	.	.	.	.	.
1993	.	.	.	.	.	.	.	.
1994	.	.	.	.	.	.	.	.
1995	.	.	.	.	.	.	.	.
1996	460	460	18	18	50	50	41	41
1997	852	852	601	601	1165	1165	1024	1024
1998	1408	1408	2386	2386	3823	3823	3811	3811
1999	2265	2265	16423	16423	24116	24116	8291	8291
2000	2960	2960	15359	15359	24575	24575	10674	10674
TOTAL	7945	7945	34787	34787	53729	53729	23841	23841
1992	14	14	1	1	0	0	0	0
1993	17	17	2	2	0	0	0	0
1994	555	555	6	6	3	3	0	0
1995	933	933	44	44	30	30	21	21
1996	1612	1612	1003	1003	3356	3356	3722	3722
1997	2405	2405	4262	4262	7262	7262	5453	5453
1998	2111	2111	3967	3967	6992	6992	5907	5907
1999	2653	2653	22284	22284	35603	35603	12023	12023
2000	3685	3685	20135	20135	30318	30318	13653	13653
TOTAL	13985	13985	51704	51704	83564	83564	40779	40779
CF-BL		0		0		0		0

*tab 6 p. 41*

*BL #'s : see p. 2 this tab*

52614 0958

K-7

diff18a.1st

## Quit Rates for In smokers

Obs	CONCODE	COMMIT	quitrate
1	Wayward	comparison	0.154
2	Vallejo	intervention	0.159
3	Peterborough	comparison	0.159
4	Brantford	intervention	0.219
5	Davenport	comparison	0.185
6	Cedar Rapids	intervention	0.233
7	Lowell	comparison	0.189
8	Fitchburg/Leominster	intervention	0.210
9	Trenton	comparison	0.184
10	Patterson	intervention	0.161
11	Las Cruces	comparison	0.185
12	Santa Fe	intervention	0.202
13	New Rochelle	comparison	0.206
14	Yonkers	intervention	0.210
15	Birmingham/Johanson City	comparison	0.185
16	Utica	intervention	0.245
17	Greensboro	comparison	0.169
18	Raleigh	intervention	0.189
19	Albany/Corvallis	comparison	0.167
20	Medford/Ashland	intervention	0.167
21	Longview/Kelso	comparison	0.159
22	Bellingham	intervention	0.188

## Quit Rates for h smokers

Obs	CONCODE	COMMIT	N	quitrate
1	Wayward	comparison	435	0.133
2	Vallejo	intervention	442	0.090
3	Peterborough	comparison	489	0.153
4	Brantford	intervention	531	0.126
5	Davenport	comparison	464	0.119
6	Cedar Rapids	intervention	475	0.135
7	Lowell	comparison	497	0.161
8	Fitchburg/Leominster	intervention	428	0.138
9	Trenton	comparison	458	0.096
10	Patterson	intervention	480	0.093
11	Las Cruces	comparison	454	0.134
12	Santa Fe	intervention	450	0.120
13	New Rochelle	comparison	451	0.153
14	Fitchburg/Leominster	intervention	432	0.169
15	Brantford	comparison	434	0.118
16	Utica	intervention	455	0.154
17	Greensboro	comparison	462	0.089
18	Raleigh	intervention	455	0.156
19	Albany/Corvallis	comparison	451	0.118
20	Medford/Ashland	intervention	426	0.096
21	Longview/Kelso	comparison	449	0.136
22	Bellingham	intervention	442	0.106

## Combined Quit Rates

## The MEANS Procedure

Variable	Mean
comparison	0.160752
intervention	0.1715897

110.217

p-value:

52614 0959

Produced by RJRTTC

in

HUMPHREY

Disclosed 1/1/93

```

*** run;
options print ls=131 ps=45 compress=yes nocenter nodate number source2 alog; *** screen
options noformat ls=225 ps=80 format=1; *** nocenter
***;
options noformat print ls=104 ps=74 compress=yes nocenter nodate number source2 alog; *** nocenter
***;
options print ps=100 ls=132 compress=yes nocenter nodate number source2 alog; *** nocenter
***;
libname d001103 '/data05a/rjrfalisc/COMMIT/001103';
libname end1988 '/data05a/rjrfalisc/COMMIT/001113/1988_Endpoint_Cohort';
libname eval1989 '/data05a/rjrfalisc/COMMIT/001113/1989_Evaluation_Cohort';
libname eval1991 '/data05a/rjrfalisc/COMMIT/001113/1991_Evaluation_Cohort';
libname eval1993 '/data05a/rjrfalisc/COMMIT/001113/1993_Endpoint_Cohort';
libname eval1993 '/data05a/rjrfalisc/COMMIT/001113/1993_Evaluation_Cohort';
libname prev1993 '/data05a/rjrfalisc/COMMIT/001113/1993_Prevalence_Survey';

%include '/data05a/rjrfalisc/COMMIT/001103/commit_endpoint_cohort_data_1988.saspry';

proc sort data=end1993 endout=outendnt93;
  by comcode seq_id member;
run;

proc sort data=d001103 endout=outcom;
  by comcode;
run;

proc sort data=end1988 base88_d(keep=comcode seq_id member statstatb)
  out=detail;
  by comcode seq_id member;
run;

proc sort data=end1988 base88_2(keep=comcode seq_id member intrstat statstatb sex)
  out=desc2;
  by comcode seq_id member;
run;

data endnt93;
  merge endnt93 (in = a keep = seq_id comcode member statstatb status93)
    desc2 (in = b keep = comcode seq_id member sex);
  by comcode seq_id member;
  if a = 1;

  merge
    detail (in=in1)
    desc2 (in=in2);
  by comcode seq_id member;
  if in1;
  if sex = 1;
  citypair = round(comcode/2);
  select(comcode);
  when(2,4,5,6,9,12,13,15,18,19,21) commit=1;
  otherwise commit=0;
end;
run;

proc freq data=prev noprint;
  where (intrstat=1 & statstatb in (1,2,3));
  tables citypair*commit / out=out3a(drop=percent);
run;

proc freq data=prev noprint;
  where (intrstat=1 & statstatb in (1));
  tables citypair*commit / out=out3b(drop=percent);
run;

data weights;
  merge
    out3a(rename=count=n)
    out3b(rename=count=eq);
  by citypair commit;
  if commit=0 then control=eq/n;
  if commit=1 then treatment=eq/n;
  if last.citypair then do;
    std.svy=mean(control,treatment);
    output;
  end;
  retain control treatment;
  drop q n;
run;

data table;
  merge endnt93 (in = a keep = seq_id comcode member status93 sex)
    prev1993 (in = b keep = seq_id comcode member status93 sex);
  by comcode;
  if a = 1;
  if status93 = 1 then heavy = 1;
  if status93 = 2 then heavy = 0;
  status93 = 1 - status93;
  if status93 = -1 then status93 = 0;
  citypair = round(comcode/2);
  quitratio(dose, num);
  proc means data = table mway noprint;
  where heavy = 1;
  class comcode commit;
  output out=quitratio;
  title 'Quit Ratios for Adose smokers';
run;

proc sort data = diffa_dose;
  by citypair commit;
run;

proc print data = diffa_dose;
  var comcode commit N quitrate;
  format comcode comcode. quitrate 5.3;
  title 'Quit Ratios for Adose smokers';
run;

proc transpose data = diffa_dose
  out = diffa_dose (rename = (col1 = control col2 = treatment));
  var quitrate;
  by citypair;
run;

%macro;
  quitratio(la,0);
  quitratio(h,1);
  ** Next, p-val and CI;

  data diffa;
  merge
    diffa_la(rename=(treatment=la
      control=la))
    diffa_h(rename=(treatment=h
      control=h));
  weights;
  by citypair;
  comparison = c_h*control+la*(1-control);
  interval = t_h*treatment + t_la*(1-treatment);
  diff = interval - comparison;
run;

proc means data = diffa mean;
  var comparison interval;
  title 'Combined Quit Rates';
run;

%macro pval;
  data pval;
  set diffa;
  by citypair;
  array diffa (11) diff01 - diff11;
  diffa(citypair) = diff;
  if citypair=1 then output;
  retain diff01 - diff11;
  keep diff01 - diff11;
run;

```

diff8a.sas

```
data perm2;  
  set perm1;  
  array diff1 (11) diff1 - diff11;  
  array temp1 (11) temp1 - temp11;  
  do i1 = 0 to 1;  
    do i2 = 0 to 1;  
      do i3 = 0 to 1;  
        do i4 = 0 to 1;  
          do i5 = 0 to 1;  
            do i6 = 0 to 1;  
              do i7 = 0 to 1;  
                do i8 = 0 to 1;  
                  do i9 = 0 to 1;  
                    do i10 = 0 to 1;  
                      do i11 = 0 to 1;  
                        if i1 = 1 then temp1(1) = diff1(1); else temp1(1) = diff1(1);  
                        if i2 = 1 then temp1(2) = diff1(2); else temp1(2) = diff1(2);  
                        if i3 = 1 then temp1(3) = diff1(3); else temp1(3) = diff1(3);  
                        if i4 = 1 then temp1(4) = diff1(4); else temp1(4) = diff1(4);  
                        if i5 = 1 then temp1(5) = diff1(5); else temp1(5) = diff1(5);  
                        if i6 = 1 then temp1(6) = diff1(6); else temp1(6) = diff1(6);  
                        if i7 = 1 then temp1(7) = diff1(7); else temp1(7) = diff1(7);  
                        if i8 = 1 then temp1(8) = diff1(8); else temp1(8) = diff1(8);  
                        if i9 = 1 then temp1(9) = diff1(9); else temp1(9) = diff1(9);  
                        if i10 = 1 then temp1(10) = diff1(10); else temp1(10) = diff1(10);  
                        if i11 = 1 then temp1(11) = diff1(11); else temp1(11) = diff1(11);  
                      end i11;  
                    end i10;  
                  end i9;  
                end i8;  
              end i7;  
            end i6;  
          end i5;  
        end i4;  
      end i3;  
    end i2;  
  end i1;  
end;
```

```
proc sort data=perm2;  
  by temp1;  
run;
```

output;

```
data perm2;  
  set perm1;  
  array diff1 (11) diff1 - diff11;  
  array temp1 (11) temp1 - temp11;  
  do i1 = 0 to 1;  
    do i2 = 0 to 1;  
      do i3 = 0 to 1;  
        do i4 = 0 to 1;  
          do i5 = 0 to 1;  
            do i6 = 0 to 1;  
              do i7 = 0 to 1;  
                do i8 = 0 to 1;  
                  do i9 = 0 to 1;  
                    do i10 = 0 to 1;  
                      do i11 = 0 to 1;  
                        if i1 = 1 then temp1(1) = diff1(1); else temp1(1) = diff1(1);  
                        if i2 = 1 then temp1(2) = diff1(2); else temp1(2) = diff1(2);  
                        if i3 = 1 then temp1(3) = diff1(3); else temp1(3) = diff1(3);  
                        if i4 = 1 then temp1(4) = diff1(4); else temp1(4) = diff1(4);  
                        if i5 = 1 then temp1(5) = diff1(5); else temp1(5) = diff1(5);  
                        if i6 = 1 then temp1(6) = diff1(6); else temp1(6) = diff1(6);  
                        if i7 = 1 then temp1(7) = diff1(7); else temp1(7) = diff1(7);  
                        if i8 = 1 then temp1(8) = diff1(8); else temp1(8) = diff1(8);  
                        if i9 = 1 then temp1(9) = diff1(9); else temp1(9) = diff1(9);  
                        if i10 = 1 then temp1(10) = diff1(10); else temp1(10) = diff1(10);  
                        if i11 = 1 then temp1(11) = diff1(11); else temp1(11) = diff1(11);  
                      end i11;  
                    end i10;  
                  end i9;  
                end i8;  
              end i7;  
            end i6;  
          end i5;  
        end i4;  
      end i3;  
    end i2;  
  end i1;  
end;
```

```
proc sort data=perm2;  
  by temp1;  
run;
```

```
data perm2;  
  set perm1;  
  array diff1 (11) diff1 - diff11;  
  array temp1 (11) temp1 - temp11;  
  do i1 = 0 to 1;  
    do i2 = 0 to 1;  
      do i3 = 0 to 1;  
        do i4 = 0 to 1;  
          do i5 = 0 to 1;  
            do i6 = 0 to 1;  
              do i7 = 0 to 1;  
                do i8 = 0 to 1;  
                  do i9 = 0 to 1;  
                    do i10 = 0 to 1;  
                      do i11 = 0 to 1;  
                        if i1 = 1 then temp1(1) = diff1(1); else temp1(1) = diff1(1);  
                        if i2 = 1 then temp1(2) = diff1(2); else temp1(2) = diff1(2);  
                        if i3 = 1 then temp1(3) = diff1(3); else temp1(3) = diff1(3);  
                        if i4 = 1 then temp1(4) = diff1(4); else temp1(4) = diff1(4);  
                        if i5 = 1 then temp1(5) = diff1(5); else temp1(5) = diff1(5);  
                        if i6 = 1 then temp1(6) = diff1(6); else temp1(6) = diff1(6);  
                        if i7 = 1 then temp1(7) = diff1(7); else temp1(7) = diff1(7);  
                        if i8 = 1 then temp1(8) = diff1(8); else temp1(8) = diff1(8);  
                        if i9 = 1 then temp1(9) = diff1(9); else temp1(9) = diff1(9);  
                        if i10 = 1 then temp1(10) = diff1(10); else temp1(10) = diff1(10);  
                        if i11 = 1 then temp1(11) = diff1(11); else temp1(11) = diff1(11);  
                      end i11;  
                    end i10;  
                  end i9;  
                end i8;  
              end i7;  
            end i6;  
          end i5;  
        end i4;  
      end i3;  
    end i2;  
  end i1;  
end;
```

```
proc sort data=perm2;  
  by temp1;  
run;
```

output;

52614 0961

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Question	Gender	Occupation	Total Agree	Agree	Disagree	Disagree Likely	Likely	Unlikely	Unlikely	Yes	No	No
12_23p1		Professional	2,936	1,970	67.1%	966	32.9%					
12_23p1		Clerical/Sales	959	632	65.9%	327	34.1%					
12_23p1		Blue Collar	776	523	67.4%	253	32.6%					
12_23p1	Male		1,201	815	67.8%	386	32.2%					
12_23p1	Female		1,638	1,079	65.9%	559	34.1%					
12_23p1	Male	Professional	1,298	891	68.6%	407	31.4%					
12_23p1	Female	Professional	518	338	65.3%	180	34.7%					
12_23p1	Male	Clerical/Sales	310	214	69.0%	96	31.0%					
12_23p1	Female	Clerical/Sales	810	527	65.1%	283	34.9%					
12_23p1	Male	Blue Collar	481	294	61.1%	187	38.9%					
12_23p1	Female	Blue Collar	481	294	61.1%	187	38.9%					
12_23p1	Male	Professional	466	309	66.3%	157	33.7%					
12_23p1	Female	Professional	466	309	66.3%	157	33.7%					
12_23p1	Male	Clerical/Sales	391	268	68.5%	123	31.5%					
12_23p1	Female	Clerical/Sales	391	268	68.5%	123	31.5%					
12_24p1		Professional	2,812	947	33.7%	1,865	66.3%					
12_24p1		Clerical/Sales	915	300	32.8%	615	67.2%					
12_24p1		Blue Collar	759	254	33.5%	505	66.5%					
12_24p1	Male		1,521	540	35.5%	981	64.5%					
12_24p1	Female		1,291	407	31.5%	884	68.5%					
12_24p1	Male	Professional	481	169	35.1%	312	64.9%					
12_24p1	Female	Professional	294	115	39.1%	179	60.9%					
12_24p1	Male	Clerical/Sales	746	256	34.3%	490	65.7%					
12_24p1	Female	Clerical/Sales	434	131	30.2%	303	69.8%					
12_24p1	Male	Blue Collar	465	139	29.9%	326	70.1%					
12_24p1	Female	Blue Collar	392	137	34.9%	255	65.1%					
12_24p1	Male	Professional	2,878	1,877	65.2%	1,001	34.8%					
12_24p1	Female	Professional	950	668	70.3%	282	29.7%					
12_24p1	Male	Clerical/Sales	776	504	64.9%	272	35.1%					
12_24p1	Female	Clerical/Sales	1,152	705	61.2%	447	38.8%					
12_24p1	Male	Blue Collar	1,586	1,007	63.5%	579	36.5%					
12_24p1	Female	Blue Collar	1,292	670	51.9%	622	48.1%					
12_24p1	Male	Professional	503	348	69.2%	155	30.8%					
12_24p1	Female	Professional	313	197	62.9%	116	37.1%					
12_24p1	Male	Clerical/Sales	770	482	62.6%	288	37.4%					
12_24p1	Female	Clerical/Sales	447	320	71.6%	127	28.4%					
12_24p1	Male	Blue Collar	463	107	23.1%	356	76.9%					
12_24p1	Female	Blue Collar	382	243	63.6%	139	36.4%					
12_25p1		Professional	1,034			644	78.8%	21.2%				
12_25p1		Clerical/Sales	997			772	77.4%	22.6%				
12_25p1		Blue Collar	810			645	79.6%	20.4%				
12_25p1	Male		1,227			973	79.3%	20.7%				
12_25p1	Female		1,668			1,320	79.1%	20.9%				
12_25p1	Male	Professional	531			402	75.7%	24.3%				
12_25p1	Female	Professional	319			263	82.4%	17.6%				
12_25p1	Male	Clerical/Sales	818			655	80.1%	19.9%				
12_25p1	Female	Clerical/Sales	466			370	79.4%	20.6%				
12_25p1	Male	Blue Collar	409			382	93.4%	6.6%				
12_25p1	Female	Blue Collar	305			31	77.8%	22.2%				
12_25p1	Male	Professional	1,007						689	55.5%	1,363	44.5%
12_25p1	Female	Professional	805						527	52.3%	480	47.7%
12_25p1	Male	Clerical/Sales	1,240						435	54.0%	370	46.0%
12_25p1	Female	Clerical/Sales	1,667						727	58.6%	513	41.4%
12_25p1	Male	Blue Collar	1,365						1,013	60.0%	674	40.0%
12_25p1	Female	Blue Collar	539						676	49.3%	689	50.7%
12_25p1	Male	Professional	317						301	55.8%	238	44.2%
12_25p1	Female	Professional	488						151	60.3%	126	39.7%
12_25p1	Male	Clerical/Sales	468						521	62.7%	310	37.3%
12_25p1	Female	Clerical/Sales	488						226	48.3%	242	51.7%
12_25p1	Male	Blue Collar	409						244	50.0%	244	50.0%
12_25p1	Female	Blue Collar	409						206	50.4%	203	49.6%



in  
HUMPHREY

89eval.sas

```

libname eval1989 '/data03a/rjrtf/eval1989/eval1989';
options nocenter nodate nonumber;

* PROC FORMAT - create formats for analysis variables ;
*****
proc format library=work;
  value sex 1='Male'
    2='Female';
  value occupation 1='Professional'
    2='Clerical/Sales'
    3='Blue Collar';
  value agree 1='Agree'
    2='Disagree';
  value likely 1='2-Likely'
    3='4-Unlikely';
  value yes 1='Yes'
    2='No';
quit;

* AGREE macro - calculate metrics for variables formatted using the agree format ;
*****
macro agree(invar);
  proc sort data=eval1989.eval1989 (where=((sex in (1,2)) and
    (id_9b in (1,2,3)) and
    (id_5a=1) and
    (sinvar in (1,2)))));
    outsinvar;
  by sex id_9b;
  proc freq data=sinvar;
    tables sinvar / missing
      noprint
      outsinvar (drop=percent);
  format sex sex.
    id_9b occupation.
    sinvar agree.;
  quit;

  proc transpose data=sinvar
    out=sinvar (drop=_LABEL_ _NAME_);
  by sex id_9b;
  var count;
  id sinvar;
  quit;

  proc summary data=sinvar;
  class sex id_9b;
  var agree disagree;
  output outsinvar (drop=_FREQ_ _TYPE_)
    sum=agree disagree;
  quit;

  data sinvar;
  set sinvar;
  label sex='Gender'
    id_9b='Occupation';
  format agree comma5.0;
  label agree='Agree';
  format disagree comma5.0;
  label disagree='Disagree';
  length total 8.;

```

```

  agree(12_23p1);
  agree(12_24p1);
  agree(12_26p1);
  *****
  * LIKELY macro - calculate metrics for variables formatted using the likely format ;
  *****
  macro likely(invar);
    proc sort data=eval1989.eval1989 (where=((sex in (1,2)) and
      (id_9b in (1,2,3)) and
      (id_5a=1) and
      (sinvar in (1,2,3,4)))));
      outsinvar;
    by sex id_9b;
    proc freq data=sinvar;
      tables sinvar / missing
        noprint
        outsinvar (drop=percent);
    format sex sex.
      id_9b occupation.
      sinvar likely.;
    quit;

    proc transpose data=sinvar
      out=sinvar (drop=_LABEL_ _NAME_);
    by sex id_9b;
    var count;
    id sinvar;
    quit;

    proc summary data=sinvar;
    class sex id_9b;
    var likely unlikely;
    output outsinvar (drop=_FREQ_ _TYPE_)
      sum=likely unlikely;
    quit;

    data sinvar;
    set sinvar;
    label sex='Gender'
      id_9b='Occupation';
    format likely comma5.0;
    label likely='Likely';
    format unlikely comma5.0;
    label unlikely='Unlikely';
    length total 8.;

```

52614 0963



05/26/89

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HUMPHREY

COMMIT  
Evaluation Survey  
Draft Instrument #14  
05/26/89 Version

52614 0965

## 2.19a From whom?

	YES	NO
a. Your children	1	2
b. Other family members	1	2
c. Your friends	1	2
d. Your physician or other health care personnel	1	2
e. Your co-workers	1	2

\*\*\* SEE NOTE AT BEGINNING OF PART 2 \*\*\*

AGREE      DISAGREE      STRONGLY      SOMEWHAT  
P1
P2

2.20 The smoke from someone else's cigarette is harmful to a nonsmoker

1                  2                  1                  2

2.21 Inhaling smoke from someone else's cigarette causes lung cancer in a non-smoker.

1                  2                  1                  2

2.22 Moderate use of cigarettes is less harmful than moderate use of alcoholic beverages.

1                  2                  1                  2

2.23 Air pollution is a greater health risk than cigarettes.

1                  2                  1                  2

2.24 Smoking cigarettes is less harmful than being 20 pounds overweight.

1                  2                  1                  2

2.25 This year far more people will die as a result of cigarette smoking than from cocaine.

1                  2                  1                  2

2.26 Smoking low-tar cigarettes is safer than smoking high-tar cigarettes.

1                  2                  1                  2

2.27 If a person has smoked for more than 20 years, there is little health benefit to quitting.

1                  2                  1                  2

2.28 The evidence that tobacco smoke is dangerous to the health of a non-smoker is exaggerated.

1                  2                  1                  2

(IF THE ANSWER TO 1.6 IS 2, GO TO PART 3 QUESTION 2, ELSE GO TO 2.29)

2.29 How likely do you think it is that you will have serious health problems from smoking if you continue to smoke? Do you think it is ...

Very likely . . . . .1  
Likely, . . . . .2  
Unlikely, or. . . . .3  
Very unlikely,. . . . .4

2.30 Do you think that your smoking has already affected your health?

YES . . . . .1  
NO. . . . .2

2.31 How likely do you think it is that you will avoid or decrease serious health problems from smoking if you quit? Do you think it is ...

Very likely . . . . .1  
Likely, . . . . .2  
Unlikely, or. . . . .3  
Very unlikely,. . . . .4

NOTE: GO TO PART 3

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HUMPHREY

# WINSTON & STRAWN

## NEW YORK TRIAL SITE

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7th Floor  
New York, NY 10038

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Facsimile: 212-487-9524

December 12, 2000

### BY HAND DELIVERY

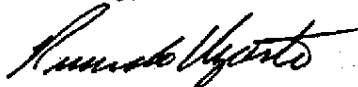
Chad Marlow, Esq.  
Orrick, Herrington & Sutcliffe LLP  
166 Montague Street  
Brooklyn, NY 11201

Re: Falisc v. American Tobacco Co., Case No. 99 CV 7392 (JBW)

Dear Chad:

• In connection with Dr. Wecker's upcoming testimony, attached please find a disk containing COMMIT reliance data.

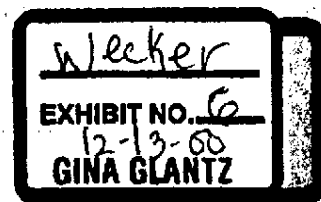
Sincerely,



Ricardo E. Ugarte

Enclosure

cc: Joint Defense Counsel (by hand w/o enclosure)



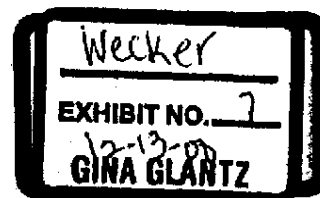
52614 0968

Quit Ratios for 1m smokers

Obs	COMCODE	COMMIT	N	quitratio
1	Hayward	comparison	519	0.154
2	Vallejo	intervention	504	0.159
3	Peterborough	comparison	453	0.199
4	Brantford	intervention	475	0.219
5	Davenport	comparison	448	0.185
6	Cedar Rapids	intervention	443	0.233
7	Lowell	comparison	475	0.189
8	Fitchburg/Leominster	intervention	463	0.210
9	Trenton	comparison	472	0.184
10	Patterson	intervention	473	0.161
11	Las Cruces	comparison	482	0.185
12	Sante Fe	intervention	470	0.202
13	New Rochelle	comparison	475	0.206
14	Yonkers	intervention	463	0.210
15	Binghampton/Johnson City	comparison	464	0.185
16	Utica	intervention	473	0.245
17	Greensboro	comparison	456	0.169
18	Raleigh	intervention	492	0.189
19	Albany/Corvallis	comparison	467	0.167
20	Medford/Ashland	intervention	479	0.167
21	Longview/Kelso	comparison	440	0.159
22	Bellingham	intervention	442	0.188

Quit Ratios for h smokers

Obs	COMCODE	COMMIT	N	quitratio
1	Hayward	comparison	435	0.133
2	Vallejo	intervention	442	0.090
3	Peterborough	comparison	489	0.153
4	Brantford	intervention	531	0.126
5	Davenport	comparison	464	0.119
6	Cedar Rapids	intervention	475	0.135
7	Lowell	comparison	497	0.161
8	Fitchburg/Leominster	intervention	428	0.138
9	Trenton	comparison	458	0.096
10	Patterson	intervention	440	0.093
11	Las Cruces	comparison	454	0.134
12	Sante Fe	intervention	450	0.120
13	New Rochelle	comparison	451	0.153
14	Yonkers	intervention	432	0.169
15	Binghampton/Johnson City	comparison	434	0.118
16	Utica	intervention	455	0.154
17	Greensboro	comparison	462	0.089
18	Raleigh	intervention	455	0.156
19	Albany/Corvallis	comparison	451	0.118
20	Medford/Ashland	intervention	426	0.096
21	Longview/Kelso	comparison	448	0.136
22	Bellingham	intervention	442	0.106



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Combined Quit Rates

The MEANS Procedure

Variable	Mean
comparison	0.1607752
intervent	0.1715897

p-value:

Obs	pval
1	0.07

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in  
HUMPHREY



(2)

```
*options mprint ls=131 ps=45 compress=yes nocenter nodate nonumber
source2 mlogic; *** screen ***;
options nofmterr ls=225 ps=80 formdlm = ' ' compress=yes nocenter
nodate nonumber source2; *** landscape6 ***;
*options nofmterr mprint ls=104 ps=74 compress=yes nocenter nodate
nonumber source2 mlogic; *** 2wide6 ***;
*options mprint ps=100 ls=132 compress=yes nocenter nodate nonumber
source2 mlogic; *** portrait6 ***;
```

```
libname d001103 '/data05a/rjrfalise/COMMIT/001103';
libname end1988 '/data05a/rjrfalise/COMMIT/001113/1988_Endpoint_Cohort';
libname eval1989 '/data05a/rjrfalise/COMMIT/001113/1989
_Evaluation_Cohort';
libname eval1991 '/data05a/rjrfalise/COMMIT/001113/1991
_Evaluation_Cohort';
libname end1993 '/data05a/rjrfalise/COMMIT/001113/1993_Endpoint_Cohort';
libname eval1993 '/data05a/rjrfalise/COMMIT/001113/1993
_Evaluation_Cohort';
libname prev1993 '/data05a/rjrfalise/COMMIT/001113/1993
_Prevalence_Survey';
```

```
%include
'data05a/rjrfalise/COMMIT/001103/commit_endpoint_cohort_data_1988.sas
arg';
```

```
proc sort data=end1993.endpnt out=endpnt93;
by comcode seq_id member;
```

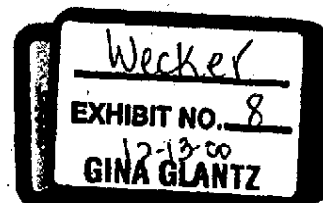
```
proc sort data=d001103.endpoint_1988(keep=comcode commit) out=comm
nodupkey;
by comcode;
```

```
proc sort data=end1988.base88_d(keep=comcode seq_id member statextb)
out=stat1;
by comcode seq_id member;
```

```
proc sort data=end1988.base88_2(keep=comcode seq_id member intrstat
statexta sex)
out=desc2;
by comcode seq_id member;
```

```
data endpnt93;
merge endpnt93 (in = a keep = seq_id comcode member statbas
Status93)
desc2 (in = b keep = comcode seq_id member sex);
by comcode seq_id member;
if a = 1;
```

```
data prev;
merge
detail(in=in1)
desc2(in=in2);
by comcode seq_id member;
if in1;
* if sex = 1;
citypair = round(comcode/2);
select(comcode);
when(2,4,5,8,9,12,13,15,18,19,21) commit=1;
otherwise commit=0;
end;
run;
```



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```

proc freq data=prev noprint;
  where(intrstat=1 & statextb in (1,2,3));
  tables citypair*commit / out=out3a(drop=percent);
run;

proc freq data=prev noprint;
  where(intrstat=1 & statextb in (1));
  tables citypair*commit / out=out3b(drop=percent);
run;

data weights;
  merge
    out3a(rename=count=n)
    out3b(rename=count=q);
  by citypair commit;
  if commit=0 then control=q/n;
  if commit=1 then treatment=q/n;
  if last.citypair then do;
    std_avg=mean(control,treatment);
    output;
  end;
  retain control treatment;
  drop q n;
run;

data table1;
  merge endpnt93 (in = a keep = seq_id comcode member statbas
status93 sex)
  comm (in = b);
  by comcode;
  if a = 1;
  if sex = 1;
  if statbas = 1 then heavy = 1;
  if statbas = 2 then heavy = 0;
  status93 = status93;
  if status93 = -1 then status93 = 0;
  citypair = round(comcode/2);

macro quitratio(dose, num);
proc means data = table1 nway noprint;
  where heavy = &num;
  class comcode commit;
  var status93;
  output out=diffs_&dose(rename = _freq_ = N) mean=quitratio;
data diffs_&dose;
  set diffs_&dose;
  citypair = round(comcode/2);
proc sort data = diffs_&dose;
  by citypair commit;
proc print data = diffs_&dose;
  var comcode commit N quitratio;
  format comcode comcode. quitratio 5.3;
  title "Quit Ratios for &dose smokers";
proc transpose data = diffs_&dose
  out = diffs_&dose (rename = (col1 = control col2 =

```

```

treatment));
    var quitrate;
    by citypair;

%mend;

%quitratio(lm,0);
%quitratio(h,1);

** Next, p-val and CI;
data diffs;
merge
    diffs_lm(rename=(treatment=t_lm
                     control=c_lm))
    diffs_h(rename=(treatment=t_h
                    control=c_h))
weights;
by citypair;
comparison = t_h*control+c_lm*(1-control);
intervent = t_h*treatment + t_lm*(1-treatment);
diff = intervent - comparison;
run;

proc means data = diffs mean;
var comparison intervent;
title 'Combined Quit Rates';

macro pval;

data perms;
set diffs;
by citypair;
array diffs {11} diff01 - diff11;
diffs{citypair} = diff;
if citypair=1 then output;
retain diff01 - diff11;
keep diff01 - diff11;
run;

data perms2;
set perms;
array diffs {11} diff01 - diff11;
array temps {11} temp01 - temp11;
do i1 = 0 to 1;
do i2 = 0 to 1;
do i3 = 0 to 1;
do i4 = 0 to 1;
do i5 = 0 to 1;
do i6 = 0 to 1;
do i7 = 0 to 1;
do i8 = 0 to 1;
do i9 = 0 to 1;
do i10 = 0 to 1;
do i11 = 0 to 1;
if i1 = 1 then temps{1} = -diffs{1}; else temps{1} = diffs{1};
if i2 = 1 then temps{2} = -diffs{2}; else temps{2} = diffs{2};
if i3 = 1 then temps{3} = -diffs{3}; else temps{3} = diffs{3};
if i4 = 1 then temps{4} = -diffs{4}; else temps{4} = diffs{4};
if i5 = 1 then temps{5} = -diffs{5}; else temps{5} = diffs{5};
if i6 = 1 then temps{6} = -diffs{6}; else temps{6} = diffs{6};

```

```

if i7 = 1 then temps{7} = -diffs{7}; else temps{7} = diffs{7};
if i8 = 1 then temps{8} = -diffs{8}; else temps{8} = diffs{8};
if i9 = 1 then temps{9} = -diffs{9}; else temps{9} = diffs{9};
if i10 = 1 then temps{10} = -diffs{10}; else temps{10} = diffs
{10};
if i11 = 1 then temps{11} = -diffs{11}; else temps{11} = diffs
{11};

```

```

avg = sum(of temp01-temp11)/11;
if sum(of i1-i11) > 0 then obs=0;
                        else obs=1;

```

```

output;
end;
end;
end;
end;
end;
end;
end;
end;
end;
end;
keep obs avg;
run;

```

```

proc sort data=perms2;
by avg;

```

```
run;
```

```

data perms2;
set perms2;
if obs=1 then do;
pval = 1 - .5/2048;
output;
end;
run;

```

```

proc print data = perms2;
var pval;
format pval 5.2;
title 'p-value: ';
mend;

```

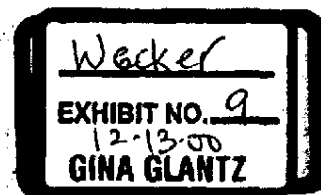
```
pval;
```

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HUMPHREY

(2)

Question	Gender	Occupation	Total	Agree	Agree	Disagree	Disagree
Likely	Likely	Unlikely	Unlikely	Yes	Yes	No	No
i2_23p1	.	.	2,936	1,970	67.1%	966	32.9%
i2_23p1	.	Professional	959	632	65.9%	327	34.1%
i2_23p1	.	Clerical/Sales	776	523	67.4%	253	32.6%
i2_23p1	.	Blue Collar	1,201	815	67.9%	386	32.1%
i2_23p1	Male	.	1,638	1,079	65.9%	559	34.1%
i2_23p1	Female	.	1,298	891	68.6%	407	31.4%
i2_23p1	Male	Professional	518	338	65.3%	180	34.7%
i2_23p1	Male	Clerical/Sales	310	214	69.0%	96	31.0%
i2_23p1	Male	Blue Collar	810	527	65.1%	283	34.9%
i2_23p1	Female	Professional	441	294	66.7%	147	33.3%
i2_23p1	Female	Clerical/Sales	466	309	66.3%	157	33.7%
i2_23p1	Female	Blue Collar	391	288	73.7%	103	26.3%
i2_24p1	.	.	2,812	947	33.7%	1,865	66.3%
i2_24p1	.	Professional	915	300	32.8%	615	67.2%
i2_24p1	.	Clerical/Sales	759	254	33.5%	505	66.5%
i2_24p1	.	Blue Collar	1,138	393	34.5%	745	65.5%
i2_24p1	Male	.	1,521	540	35.5%	981	64.5%
i2_24p1	Female	.	1,291	407	31.5%	884	68.5%
i2_24p1	Male	Professional	481	169	35.1%	312	64.9%
i2_24p1	Male	Clerical/Sales	294	115	39.1%	179	60.9%
i2_24p1	Male	Blue Collar	746	256	34.3%	490	65.7%
i2_24p1	Female	Professional	434	131	30.2%	303	69.8%
i2_24p1	Female	Clerical/Sales	465	139	29.9%	326	70.1%
i2_24p1	Female	Blue Collar	392	137	34.9%	255	65.1%
i2_26p1	.	.	2,878	1,877	65.2%	1,001	34.8%
i2_26p1	.	Professional	950	668	70.3%	282	29.7%
i2_26p1	.	Clerical/Sales	776	504	64.9%	272	35.1%
i2_26p1	.	Blue Collar	1,152	705	61.2%	447	38.8%



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12_26p1	Male		1,586	1,007	63.5%	579	36.5%
12_26p1	Female		1,292	870	67.3%	422	32.7%
12_26p1	Male	Professional	503	348	69.2%	155	30.8%
12_26p1	Male	Clerical/Sales	313	197	62.9%	116	37.1%
12_26p1	Male	Blue Collar	770	462	60.0%	308	40.0%
12_26p1	Female	Professional	447	320	71.6%	127	28.4%
12_26p1	Female	Clerical/Sales	463	307	66.3%	156	33.7%
12_26p1	Female	Blue Collar	382	243	63.6%	139	36.4%
12_29			3,034				
12_29	78.8%	644	21.2%				
12_29		Professional	997				
12_29	77.4%	815	22.6%				
12_29		Clerical/Sales	810				
12_29	79.6%	165	20.4%				
12_29		Blue Collar	1,227				
12_29	79.3%	254	20.7%				
12_29	Male		1,668				
12_29	79.1%	448	20.9%				
12_29	Female		1,366				
12_29	78.3%	296	21.7%				
12_29	Male	Professional	531				
12_29	75.7%	129	24.3%				
12_29	Male	Clerical/Sales	319				
12_29	82.4%	56	17.6%				
12_29	Male	Blue Collar	818				
12_29	80.1%	161	19.9%				
12_29	Female	Professional	466				
12_29	79.4%	94	20.6%				
12_29	Female	Clerical/Sales	491				
12_29	77.8%	109	22.2%				
12_29	Female	Blue Collar	409				
12_29	77.8%	91	22.2%				
12_30			3,052				
12_30		Professional	1,689	55.3%	1,363	44.7%	
12_30		Clerical/Sales	527	52.3%	480	47.7%	
12_30		Blue Collar	805				
12_30			435	54.0%	370	46.0%	
12_30	Male		727	58.6%	513	41.4%	
12_30	Female		1,687				
12_30			1,013	60.0%	674	40.0%	
12_30	Male	Professional	539				
12_30	Male	Clerical/Sales	301	55.8%	238	44.2%	
12_30	Male	Blue Collar	317				
12_30			191	60.3%	126	39.7%	
12_30	Female	Professional	831				
12_30	Female	Clerical/Sales	521	62.7%	310	37.3%	
12_30	Female	Blue Collar	468				
12_30			226	48.3%	242	51.7%	
12_30	Female	Clerical/Sales	488				

i2\_30 Female Blue Collar

244	50.0%	244	50.0%
409			
206	50.4%	203	49.6%

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4

```
libname eval1989 '/data05a/rjrfalise/COMMIT/001113/1989
_Evaluation_Cohort';
```

```
options nocenter nodate nonumber;
```

```
*****;
* PROC FORMAT - create formats for analysis variables ;
*****;
```

```
proc format library=work;
  value sex 1='Male'
           2='Female';
  value occupation 1='Professional'
                  2='Clerical/Sales'
                  3='Blue Collar';
  value agree 1='Agree'
              2='Disagree';
  value likely 1-2='Likely'
               3-4='Unlikely';
  value yes 1='Yes'
            2='No';
```

```
quit;
```

```
*****;
* AGREE macro - Calculate metrics for variables formatted using the
agree format ;
*****;
```

```
*****;
macro agree(invar);
```

```
proc sort data=eval1989.eval89 (where=((sex in (1,2)) and
                                         (i4_9b in (1,2,3)) and
                                         (i1_6=1) and
                                         (&invar in (1,2))))
```

```
  out=&invar;
  by sex i4_9b;
```

```
quit;
```

```
proc freq data=&invar;
  by sex i4_9b;
  tables &invar / missing
            noprint
            out=&invar (drop=percent);
  format sex
          i4_9b occupation.
          &invar agree.;
```

```
quit;
```

```
proc transpose data=&invar
               out=&invar (drop=_LABEL_ _NAME_);
  by sex i4_9b;
  var count;
  id &invar;
```

```
quit;
```

```
proc summary data=&invar;
  class sex i4_9b;
  var agree disagree;
  output out=&invar (drop=_FREQ_ _TYPE_)
```



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```

sum=agree disagree;
quit;

data &invar;
  set &invar;

  label sex='Gender'
        i4_9b='Occupation';

  format agree comma5.0;
  label agree='#*Agree';

  format disagree comma5.0;
  label disagree='#*Disagree';

  length total 8.;
  format total comma5.0;
  label total='Total';
  total=sum(agree,disagree);

  length agree_pct 8.;
  format agree_pct percent7.1;
  label agree_pct='%*Agree';
  agree_pct=agree/total;

  length disagree_pct 8.;
  format disagree_pct percent7.1;
  label disagree_pct='%*Disagree';
  disagree_pct=disagree/total;

  length question $ 8;
  label question='Question';
  question="&invar";

run;

mend agree;

agree(i2_23p1)
agree(i2_24p1)
agree(i2_26p1)
.....
*****
* LIKELY macro - calculate metrics for variables formatted using the
* likely format ;
*****
*****;

macro likely(invar);

proc sort data=eval1989.eval89 (where=((sex in (1,2)) and
                                         (i4_9b in (1,2,3)) and
                                         (i1_6=1) and
                                         (&invar in (1,2,3,4))))

  out=&invar;
  by sex i4_9b;

quit;

proc freq data=&invar;
  by sex i4_9b;

```

```

tables &invar / missing
              noprint
              out=&invar (drop=percent);
format sex sex.
       i4_9b occupation.
       &invar likely.;

quit;

proc transpose data=&invar
              out=&invar (drop=_LABEL_ _NAME_);
  by sex i4_9b;
  var count;
  id &invar;

quit;

proc summary data=&invar;
  class sex i4_9b;
  var likely unlikely;
  output out=&invar (drop=_FREQ_ _TYPE_)
         sum likely unlikely;

quit;

data &invar;
  set &invar;

  label sex='gender'
        i4_9b='Occupation';

  format likely comma5.0;
  label likely='*Likely';

  format unlikely comma5.0;
  label unlikely='*Unlikely';

  length total 8.;
  format total comma5.0;
  label total='Total';
  total=sum(likely,unlikely);

  length likely_pct 8.;
  format likely_pct percent7.1;
  label likely_pct='*Likely';
  likely_pct=likely/total;

  length unlikely_pct 8.;
  format unlikely_pct percent7.1;
  label unlikely_pct='*Unlikely';
  unlikely_pct=unlikely/total;

  length question $ 8;
  label question='Question';
  question="&invar";

%mend likely;

%likely(i2_29);

*****
*****;

```

Produced by RJRTIC

```
* YES macro - calculate metrics for variables formatted using the yes
format ;
*****
*****;

%macro yes(invar);

proc sort data=eval1989.eval89 (where=((sex in (1,2)) and
                                     (i4_9b in (1,2,3)) and
                                     (i1_6=1) and
                                     (&invar in (1,2))))

    out=&invar;
    by sex i4_9b;
quit;

proc freq data=&invar;
    by sex i4_9b;
    tables &invar / missing
               noprint
    out=&invar (drop=percent);

    format sex sex.
           i4_9b occupation.
           &invar yes.;
quit;

proc transpose data=&invar
    out=&invar (drop=_LABEL_ _NAME_);
    by sex i4_9b;
    var count;
    id &invar;
quit;

proc summary data=&invar;
    class sex i4_9b;
    var yes no;
    output out=&invar (drop=_FREQ_ _TYPE_)
           sum=yes no;
quit;

data &invar;
    set &invar;

    label sex='Gender'
           i4_9b='Occupation';

    format yes comma5.0;
    label yes='#*Yes';

    format no comma5.0;
    label no='#*No';

    length total 8.;
    format total comma5.0;
    label total='Total';
    total=sum(yes,no);

    length yes_pct 8.;
    format yes_pct percent7.1;
    label yes_pct='#*Yes';
    yes_pct=yes/total;
```

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```

length no_pct 8.;
format no_pct percent7.1;
label no_pct="%*No";
no_pct=no/total;

length question $ 8;
label question='Question';
question="&invar";

run;

%mend yes;

%yes(i2_30);

*****;
* DATFILE - combine datasets generated by macros and print ;
*****;

filename outfile /home/rjrfalis/sac/11_29_00/89eval/89eval.tsv lrecl=
3000;

data datfile;
    set i2_23p1
        i2_24p1
        i2_26p1
        i2_29
        i2_30;

    file outfile;
    put question;
    sex;
    i4_9b;
    total;
    agree;
    agree_pct;
    disagree;
    disagree_pct;
    likely;
    likely_pct;
    unlikely;
    unlikely_pct;
    yes;
    yes_pct;
    no;
    no_pct;

run;

proc print data=datfile
    label
    noobs
    split='*'
    uniform;
    var question sex i4_9b total agree agree_pct disagree
    disagree_pct
    likely likely_pct unlikely
    unlikely_pct
    yes yes_pct no no_pct;
quit;

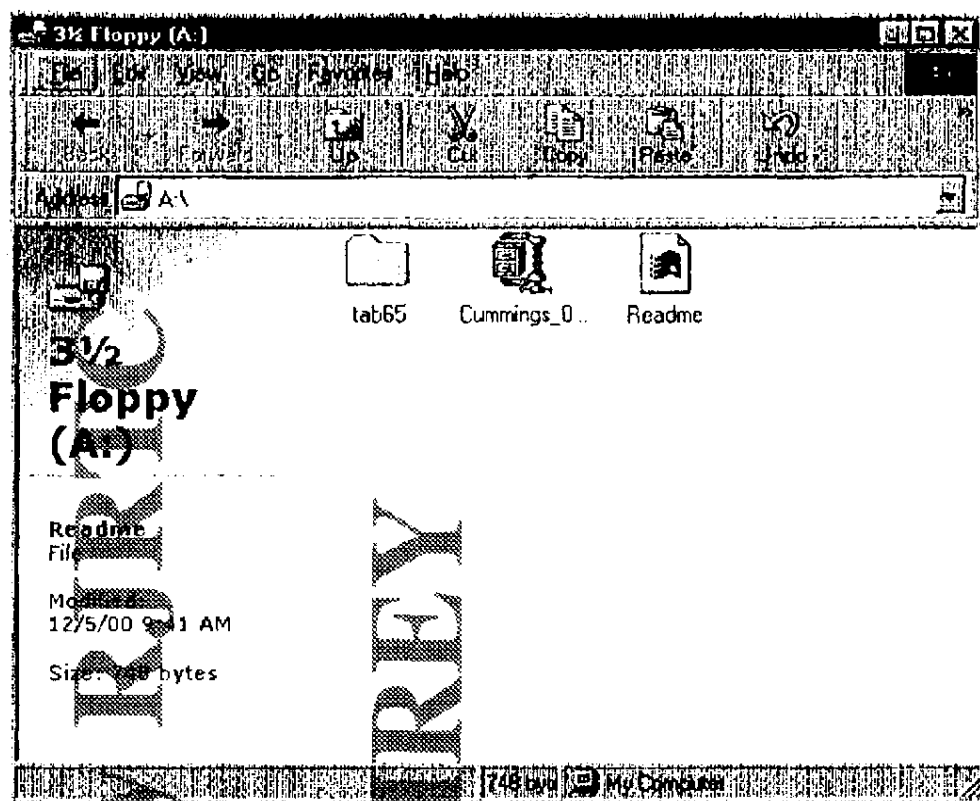
```

\*\*\*\*\*;  
\* ENDSAS ;  
\*\*\*\*\*;

endsas;

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in  
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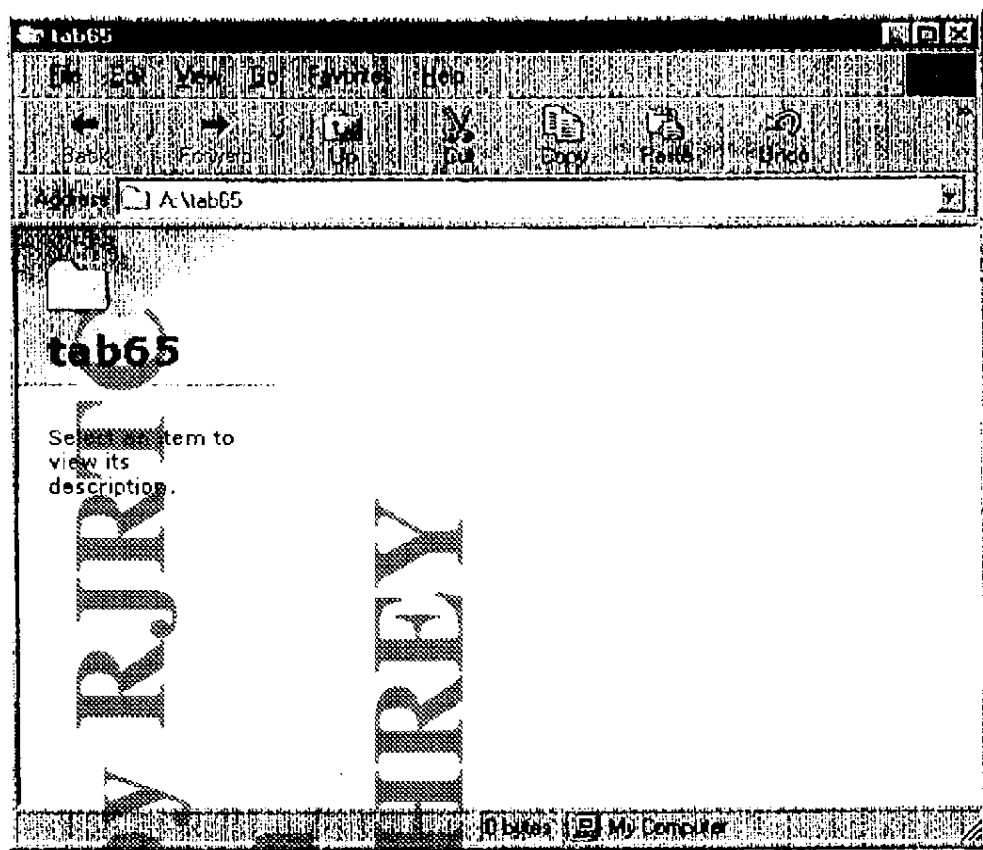
52614 0983



produced by KIK in HUMPHREY

52614 0984



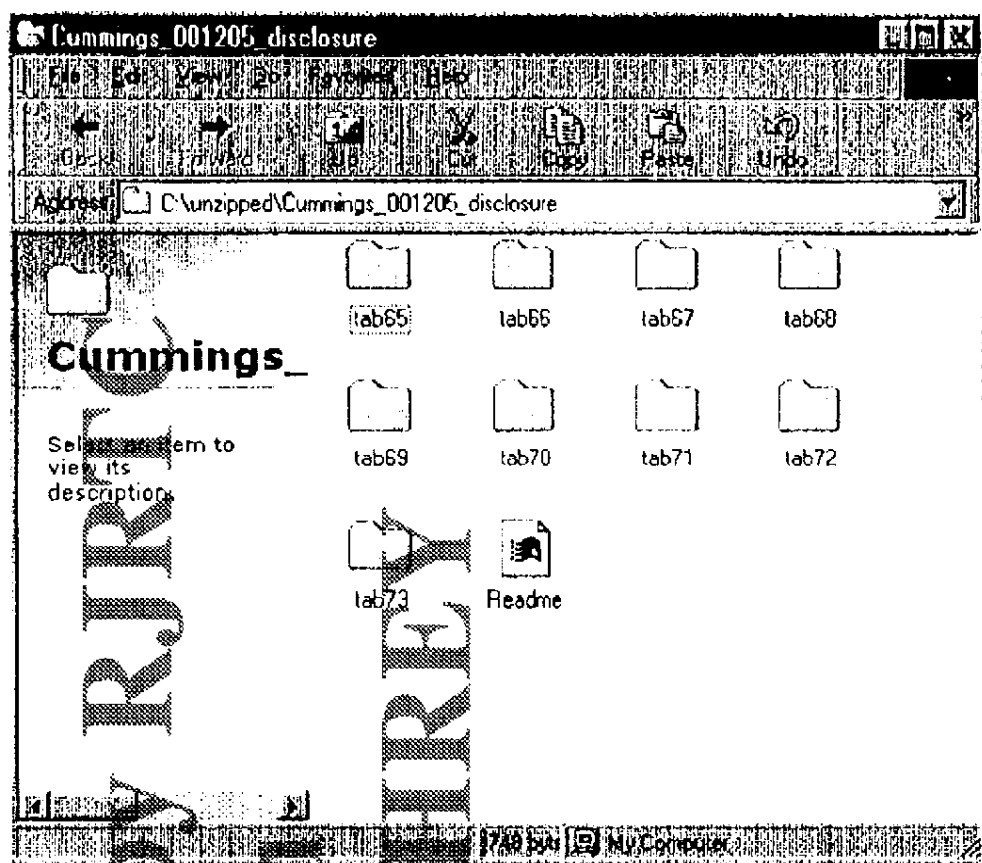


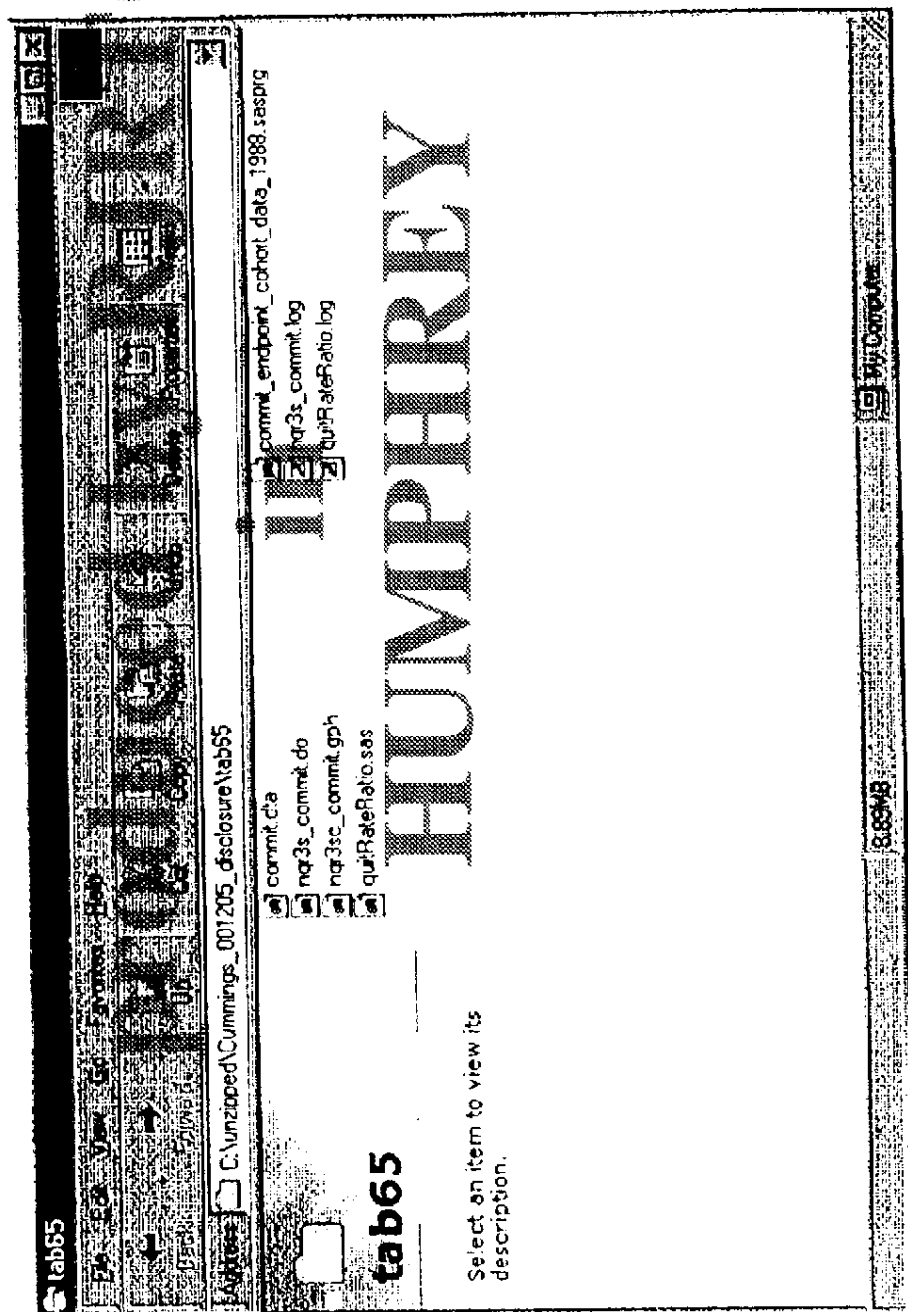
Relevant data files received from plaintiffs 001103 and 001113 have been translated into SAS7/8 format using DBMS/Copy Version 7.0.0. The SAS7/8 library and file names correspond to the original file names as follows:

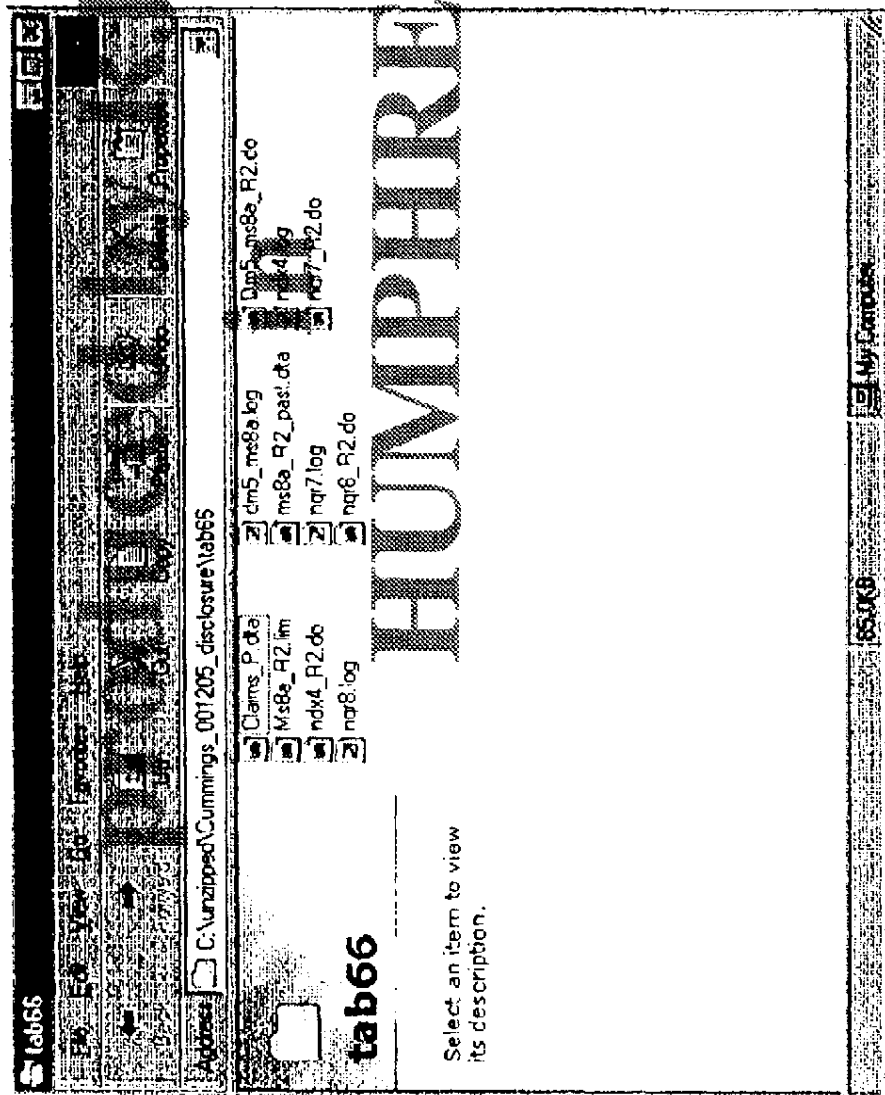
COMMIT endpoint cohort data 1988.sav ->  
/data05a/rjrfalise/COMMIT/001103/endpoint\_1988.sas7bdat  
COMMIT endpoint cohort data 1993.sav ->  
/data05a/rjrfalise/COMMIT/001103/endpoint\_1993.sas7bdat  
  
1988 Baseline survey\_descriptive file2.dbf ->  
/data05a/rjrfalise/COMMIT/001113/1988\_Endpoint\_Cohort/base88\_2.sas7bdat  
1988 Baseline survey\_detailed survey data.dbf ->  
/data05a/rjrfalise/COMMIT/001113/1988\_Endpoint\_Cohort/base88\_d.sas7bdat  
  
endpnt.sav ->  
/data05a/rjrfalise/COMMIT/001113/1993\_Endpoint\_Cohort/endpnt.sas7bdat

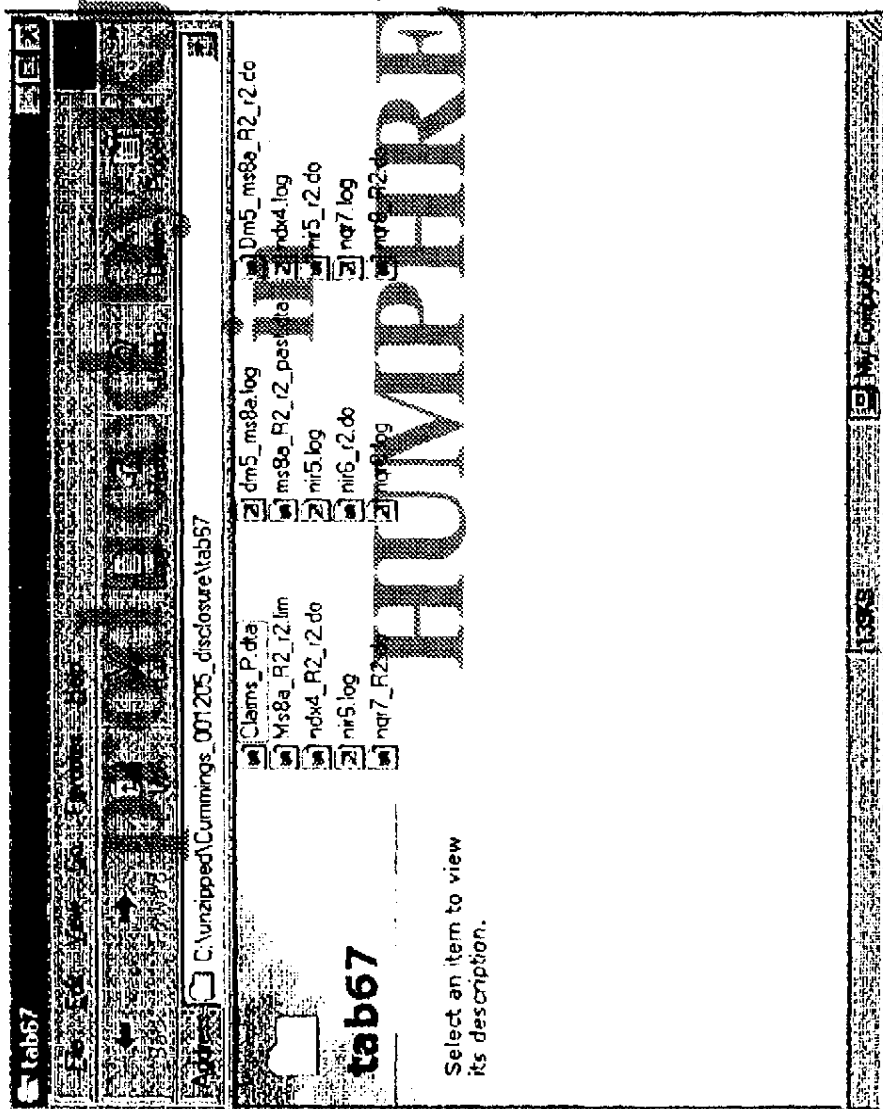
produced by R.J. RICHIE  
in  
HUMPHREY

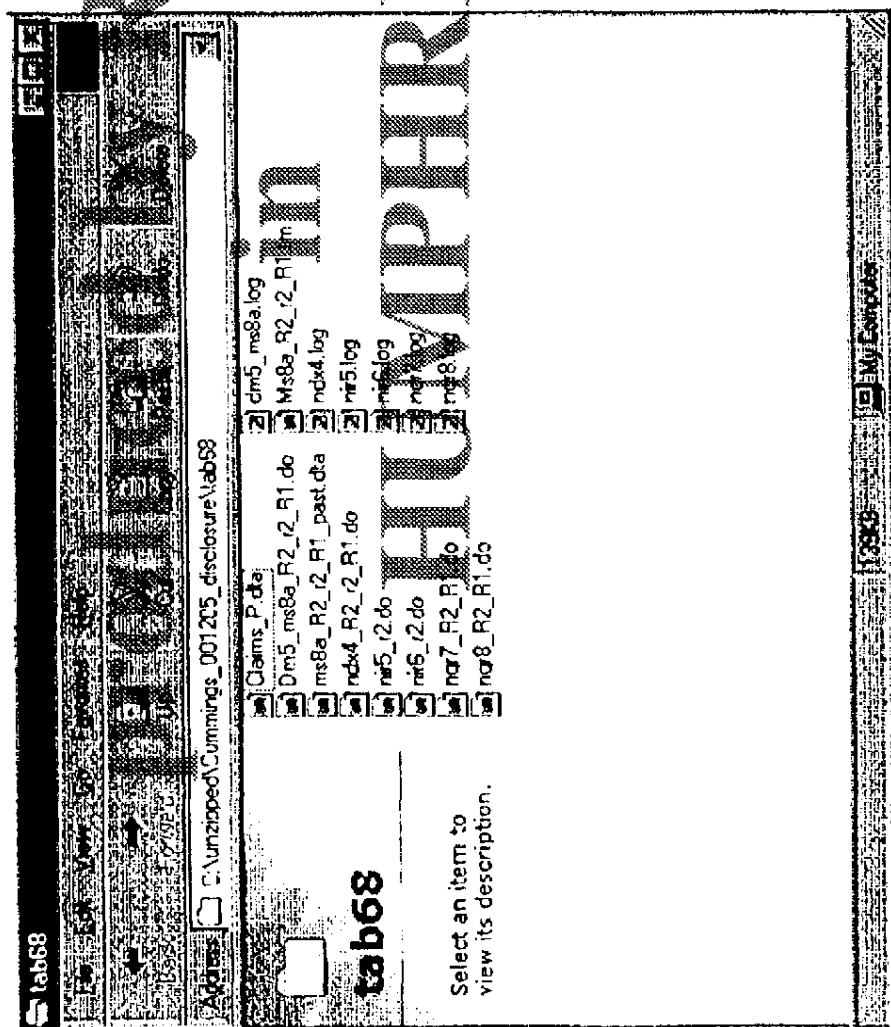


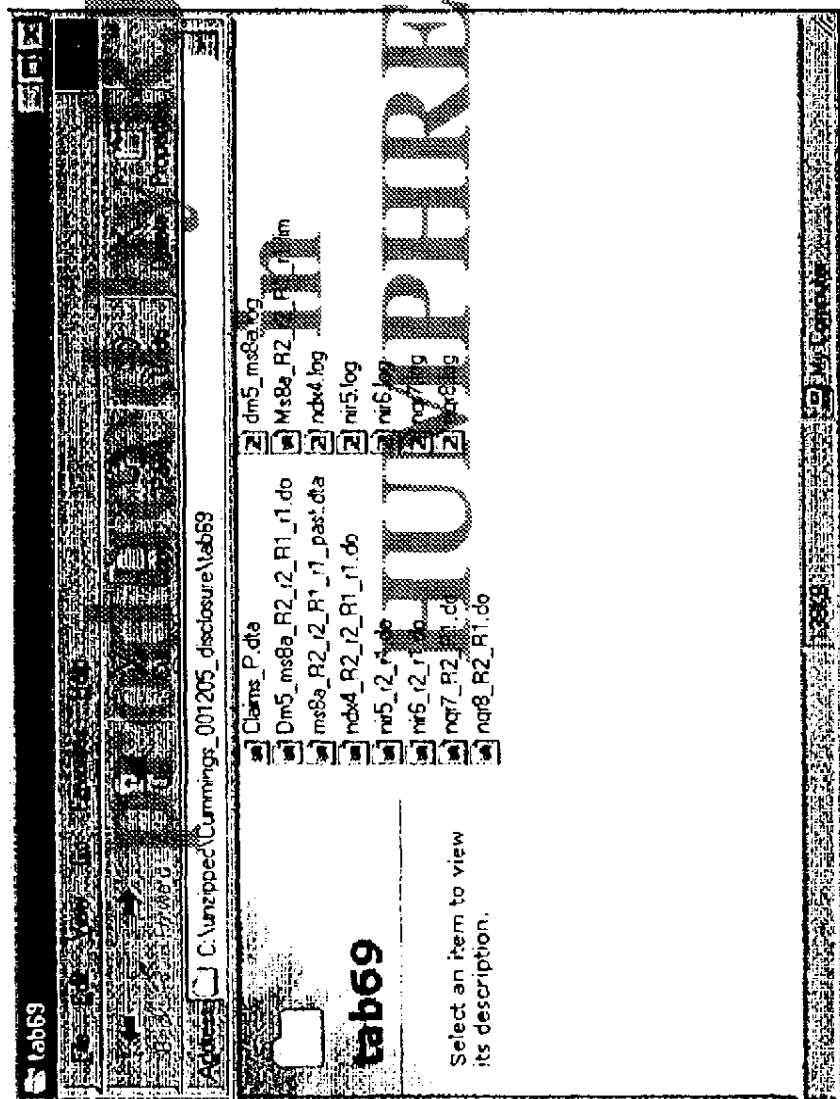


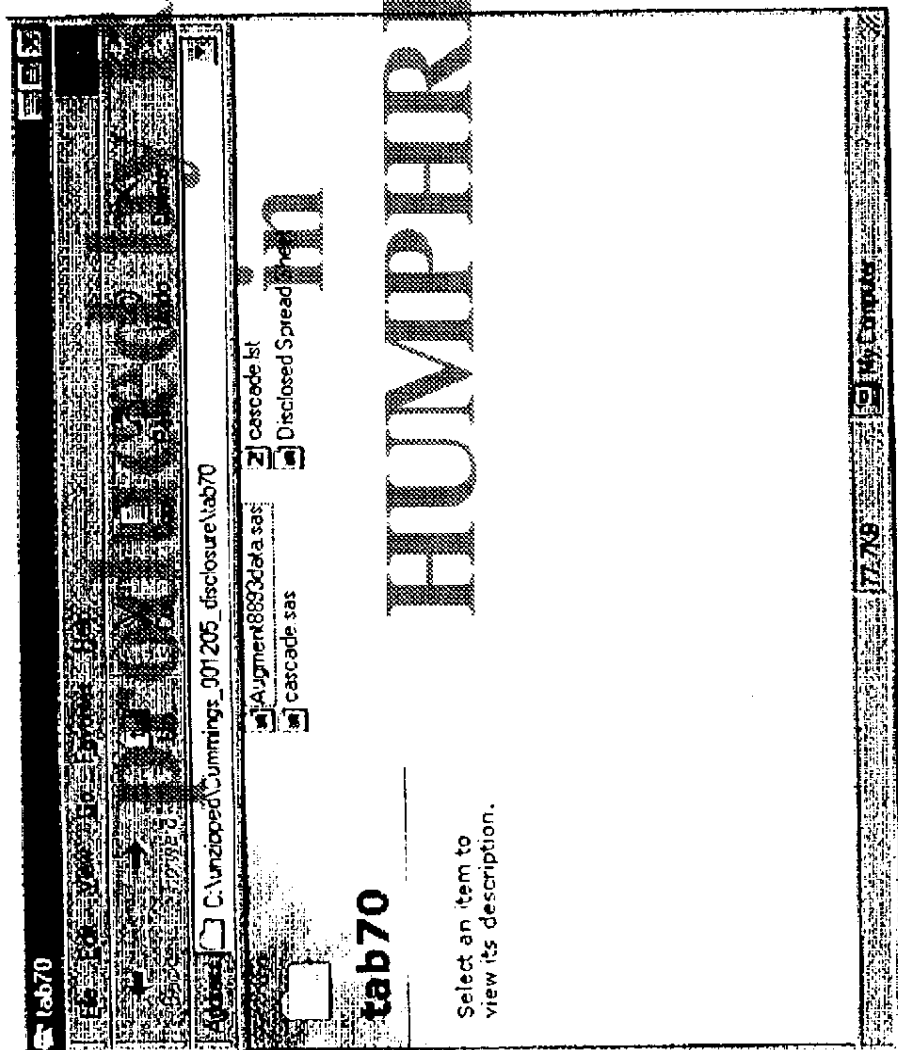




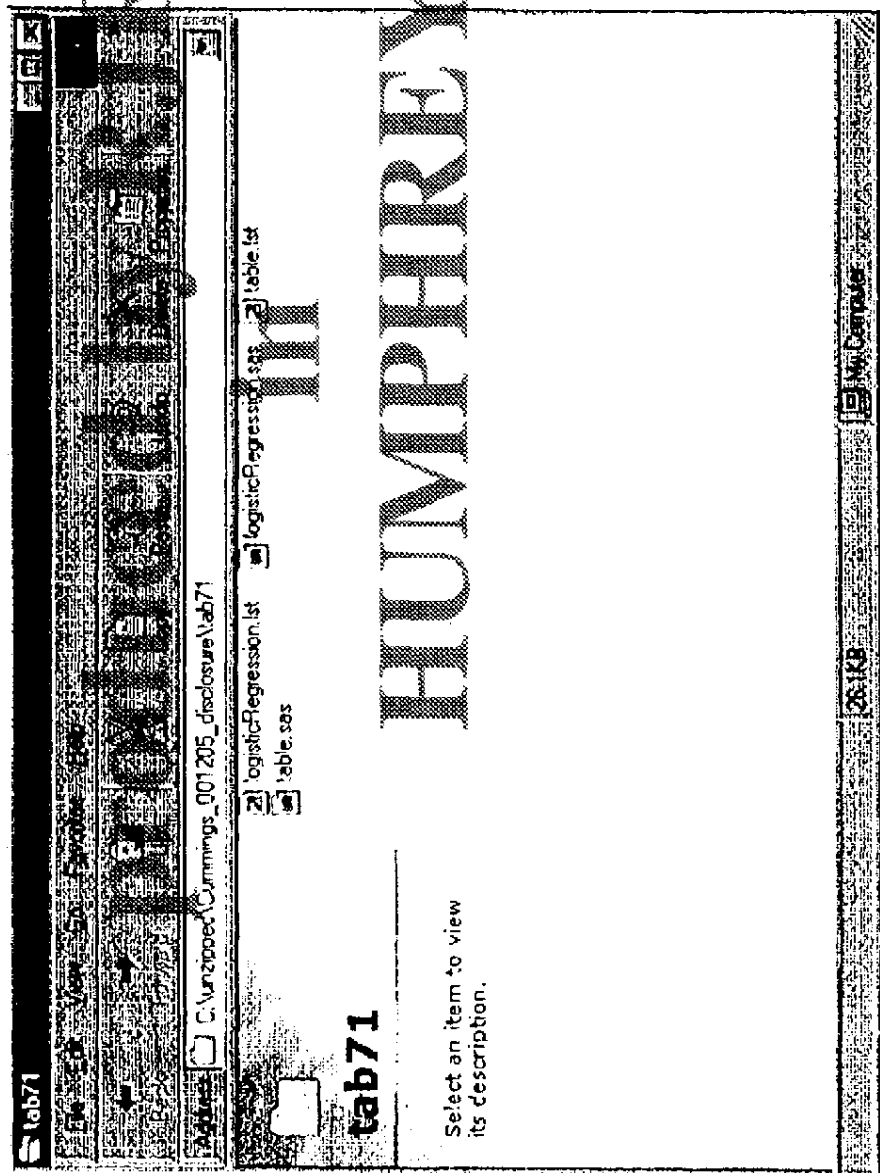




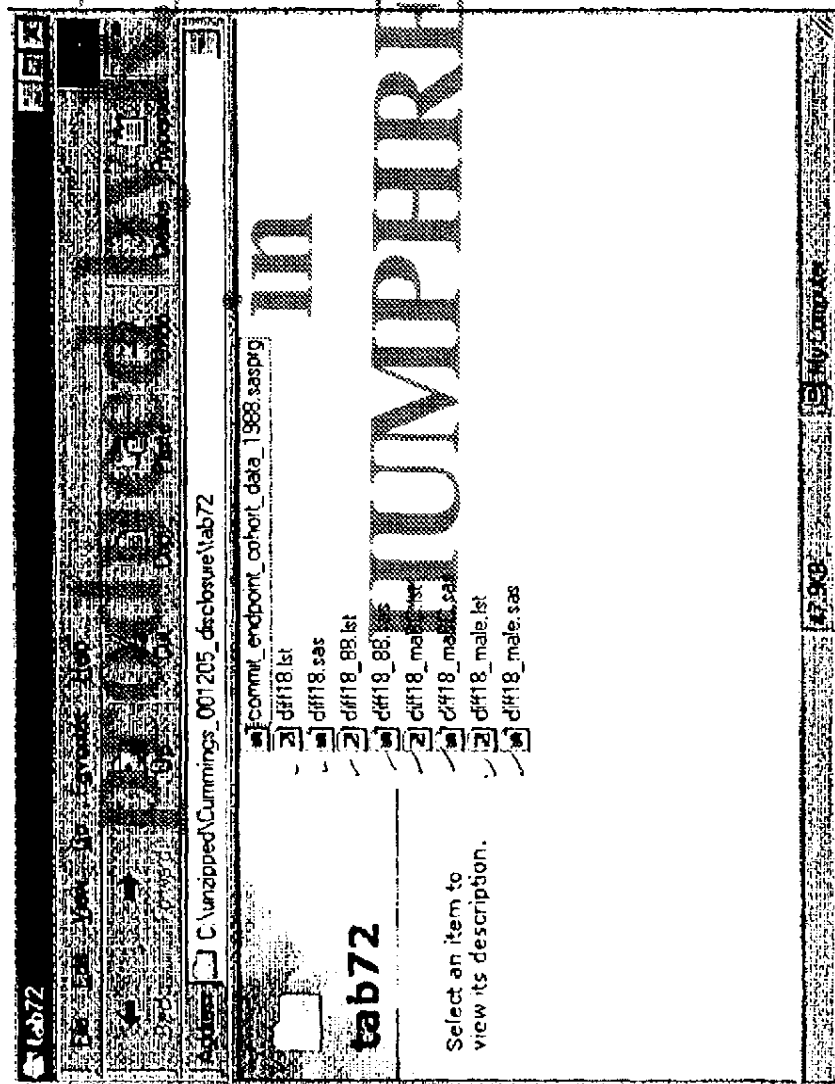




Select an item to  
view its description.







tab73

Address: C:\unzipped\Cummings\_001205\_disclosure\lab73

Claims (f1.xls)

tab73

Select an item to view its description.

tab73

RJRTC

in

HUMPHIREY

Relevant data files received from plaintiffs 001103 and 001113 have been translated into SAS7/8 format using DBMS/Copy Version 7.0.0. The SAS7/8 library and file names correspond to the original file names as follows:

COMMIT endpoint cohort data 1988.sav ->  
/data05a/rjrfalise/COMMIT/001103/endpoint\_1988.sas7bdat  
COMMIT endpoint cohort data 1993.sav ->  
/data05a/rjrfalise/COMMIT/001103/endpoint\_1993.sas7bdat  
  
1988 Baseline survey\_descriptive file2.dbf ->  
/data05a/rjrfalise/COMMIT/001113/1988\_Endpoint\_Cohort/base88\_2.sas7bdat  
1988 Baseline survey\_detailed survey data.dbf ->  
/data05a/rjrfalise/COMMIT/001113/1988\_Endpoint\_Cohort/base88\_d.sas7bdat  
  
endpnt.sav ->  
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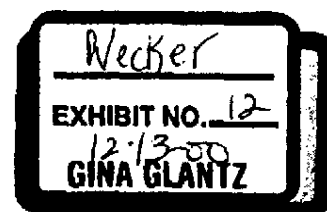
produced by RJR  
in  
HUMPHREY

**Ealise: Predictors of Smoking Cessation Between 1988 and 1993 as reported by  
Hymowitz (1997; Tbl 2) Plus Occupational Group, Estimated Using Logistic  
Regression  
from COMMIT Data Produced by Cummings (11/10/00)**

			As Reported by Hymowitz (1997; Table 2)			Predictors Used by Hymowitz (1997; Table 2) & Occup. Group	
Characteristic	Sample Size	% Quit	Odds Ratio*	95% CI	P-value	Odds Ratio	95% CI
COMMIT Community**							
Comparison	6,733	23.4%	1.00	Referent		1.00	Referent
Intervention	6,682	24.6%	1.07	0.98 1.17	0.1108	1.07	0.98 1.17
Sex							
Male	6,599	24.0%	1.00	Referent		1.00	Referent
Female	6,816	23.9%	0.85	0.78 0.94	0.0009	0.86	0.78 0.95
Age (years)							
25-34	4,249	22.8%	1.00	Referent		1.00	Referent
35-44	4,249	22.0%	0.99	0.88 1.11	0.8649	0.99	0.88 1.11
45-54	2,817	24.6%	1.20	1.06 1.37	0.0038	1.20	1.06 1.37
55-64	2,100	29.3%	1.50	1.37 1.81	<.0001	1.57	1.36 1.80
Race							
White	10,072	23.3%	1.00	Referent		1.00	Referent
Black	882	23.7%	0.98	0.82 1.17	0.8362	0.98	0.82 1.17
Hispanic	697	30.0%	1.00	0.87 1.28	0.5918	1.05	0.87 1.28
Canadian	1,449	23.1%	0.98	0.81 1.13	0.6142	0.95	0.81 1.12
Asian	138	28.3%	0.90	0.69 1.37	0.6274	0.91	0.60 1.39
American Indian	117	20.5%	0.89	0.55 1.45	0.6470	0.89	0.55 1.44
Other	42	33.3%	1.40	0.73 3.02	0.2695	1.50	0.74 3.05
Annual household income							
< \$10,000	1,139	20.3%	1.00	Referent		1.00	Referent
\$10,000 - \$24,999	3,750	22.2%	1.10	0.97 1.38	0.1168	1.14	0.95 1.36
\$25,001 - \$49,999	4,087	24.2%	1.34	1.12 1.61	0.0014	1.32	1.10 1.58
> \$50,000	3,456	26.0%	1.40	1.22 1.77	<.0001	1.44	1.19 1.73
Education (years)							
<12	2,528	22.4%	1.00	Referent		1.00	Referent
12	3,237	23.9%	1.03	0.89 1.19	0.6681	1.02	0.88 1.18
13-15	5,367	23.5%	1.00	0.87 1.15	0.9944	0.98	0.85 1.13
>16	2,257	26.9%	1.05	0.89 1.23	0.6012	1.00	0.84 1.19
Frequency of alcohol consumption							
Daily	1,572	20.9%	1.00	Referent		1.00	Referent
3-4 times/week	1,286	21.0%	0.98	0.80 1.19	0.8273	0.98	0.80 1.19
1-2 times/week	3,064	23.4%	1.09	0.93 1.29	0.2829	1.09	0.93 1.29
1-3 times/month	2,299	24.8%	1.24	1.05 1.47	0.0137	1.24	1.05 1.48
1/month or never	5,100	25.6%	1.35	1.16 1.57	0.0001	1.35	1.16 1.58

Disclosed Spread Sheet  
Sheet1

52614 0998



## Cigarettes smoked daily in 1988

>=25	5,566	18.7%	1.00	Referent		1.00	Referent		
15-24	4,783	22.7%	1.15	1.03	1.29	0.0103	1.15	1.03	1.29
5-14	2,356	32.4%	1.59	1.38	1.83	<.0001	1.59	1.38	1.83
<5	698	46.0%	2.38	1.92	2.96	<.0001	2.39	1.93	2.96

## Age started smoking (years)

<=15	3,225	21.2%	1.00	Referent			1.00	Referent		
16-19	6,606	23.1%	1.03	0.92	1.16	0.5908	1.03	0.92	1.16	
>=20	3,584	28.1%	1.16	1.01	1.32	0.0310	1.16	1.01	1.32	

## Time to first cigarette (minutes)

<10	4,329	17.9%	1.00	Referent		1.00	Referent		
10-30	3,980	21.1%	1.18	1.05	1.33	0.0069	1.18	1.05	1.33
31-60	2,431	26.2%	1.41	1.23	1.62	<.0001	1.41	1.23	1.62
>60	2,646	35.9%	1.84	1.69	2.14	<.0001	1.84	1.59	2.14

## Use non-cigarette product

No	3,003	24.0%	1.00	Referent		1.00	Referent		
Yes	408	24.3%	0.86	0.66	1.12	0.2554	0.86	0.66	1.13

## Type of cigarette

Premium	12,078	24.4%	1.00	Referent		1.00	Referent		
Discount	608	18.8%	0.85	0.68	1.07	0.1587	0.86	0.68	1.07
Generic	173	15.0%	0.64	0.41	0.99	0.0427	0.64	0.41	0.99


## Quit attempts during 12 months prior to baseline

0	8,235	22.6%	1.00	Referent		1.00	Referent		
1	2,427	24.4%	1.07	0.95	1.21	0.2468	1.07	0.95	1.21
2	2,717	27.7%	1.14	1.01	1.29	0.0324	1.14	1.01	1.29

## Desire to quit

Not at all	2,200	22.2%	1.00	Referent		1.00	Referent		
Some	2,116	22.9%	1.20	1.02	1.40	0.0296	1.20	1.02	1.40
Some	4,126	22.9%	1.13	0.98	1.31	0.0890	1.13	0.98	1.31
At all	4,882	26.0%	1.24	1.07	1.44	0.0037	1.24	1.07	1.44

## Number of other household smokers

0	7,206	25.5%	1.00	Referent		1.00	Referent		
 ≥1	6,209	22.1%	0.87	0.80	0.95	0.0026	0.87	0.80	0.96

## Occupation group

Blue collar	3,586	22.7%	-	-	1.00	Referent
Professional	3,753	26.2%	-	-	1.08	0.95 1.23
Clerical / Sales	3,182	24.2%	-	-	1.03	0.91 1.17
None / Unknown	423	22.3%	-	-	0.94	0.81 1.10

\*Labelled as a relative risk by Hymowitz et al

\*\* Not originally presented in the paper

InterventionCity Crossed with Time Crossed with State  
Intervention is Interaction of InterventionCity and Time

The LOGISTIC Procedure

Model Information

Data Set	WORK.BEFOREAFTER
Response Variable (Events)	Events
Response Variable (Trials)	Trials
Number of Observations	44
Link Function	Logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	40206
2	Nonevent	105209

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	171477.98	170874.60
SC	171487.87	171013.02
-2 Log L	171475.98	170846.60

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	629.3840	13	<.0001
Score	621.4195	13	<.0001
Wald	617.0955	13	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8611	0.0201	1842.3951	<.0001
ca	1	-0.1190	0.0273	19.0379	<.0001
on	1	-0.2962	0.0277	114.3997	<.0001



52614 1000

ia	1	-0.0667	0.0270	6.1201	0.0134
ma	1	-0.1472	0.0273	29.0393	<.0001
nj	1	-0.4348	0.0285	232.3970	<.0001
nm	1	0.1282	0.0265	23.3621	<.0001
ny1	1	-0.0791	0.0271	8.5326	0.0035
ny2	1	-0.1683	0.0273	37.9695	<.0001
nc	1	-0.1104	0.0272	16.5336	<.0001
or	1	-0.0193	0.0269	0.5124	0.4741
time	1	-0.1495	0.0297	25.3590	<.0001
InterventionCity	1	0.0499	0.0123	16.4778	<.0001
intervention	1	0.0436	0.0416	1.0987	0.2946

#### Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
ca	0.888	0.842	0.937
on	0.744	0.704	0.785
ia	0.935	0.887	0.986
ma	0.863	0.818	0.911
nj	0.647	0.612	0.685
nm	1.137	1.079	1.197
ny1	0.924	0.876	0.974
ny2	0.945	0.801	0.892
nc	0.895	0.849	0.944
or	0.981	0.931	1.034
time	0.861	0.812	0.913
InterventionCity	1.051	1.026	1.077
intervention	1.045	0.963	1.133

#### Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.6	Somers' D	0.084
Percent Discordant	43.2	Gamma	0.089
Percent Tied	5.2	Tau-a	0.034
Pairwise	4230033054	c	0.542

InterventionCity is the interaction affect since the analysis is  
 conducted separately for each time period  
 InterventionCity is Crossed with State  
 Shows before the intervention study

# The LOGISTIC Procedure

## Model Information

Data Set	WORK.BEFOREAFTER
Response Variable (Events)	Events
Response Variable (Trials)	Trials
Number of Observations	22
Link Function	Logit
Optimization Technique	Fisher's scoring

## Response Profile

Ordered Value	Binary Outcome	Total Frequency
2	Event	36792
	Nonevent	95208

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	156223.28	155586.94
SC	156233.02	155704.42
-2 Log Likelihood	156221.28	155562.94

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	658.3382	11	<.0001
Score	648.5437	11	<.0001
Wald	643.0361	11	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8369	0.0207	1629.0151	<.0001



ca	1	-0.1451	0.0284	26.0813	<.0001
on	1	-0.3272	0.0291	126.6961	<.0001
ia	1	-0.0763	0.0282	7.3216	0.0068
ma	1	-0.1904	0.0286	44.4604	<.0001
nj	1	-0.5009	0.0298	281.8245	<.0001
nm	1	0.1172	0.0277	17.9264	<.0001
ny1	1	-0.1203	0.0283	18.0262	<.0001
ny2	1	-0.2006	0.0286	49.2328	<.0001
nc	1	-0.1277	0.0284	20.2831	<.0001
or	1	-0.0189	0.0280	0.4526	0.5011
InterventionCity	1	0.0500	0.0123	16.4916	<.0001

#### Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
ca	0.865	0.818	0.914
on	0.721	0.681	0.763
ia	0.927	0.877	0.979
ma	0.827	0.782	0.874
nj	0.606	0.572	0.642
nm	1.124	1.065	1.187
ny1	0.887	0.839	0.937
ny2	0.818	0.774	0.865
nc	0.880	0.833	0.930
or	0.981	0.929	1.037
InterventionCity	1.051	1.026	1.077

#### Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.2	Somers' D	0.087
Percent Discordant	42.6	Gamma	0.093
Percent Tied	6.2	Tau-a	0.035
Pairs	3502892736	c	0.543

(InterventionCity Crossed with Time) Nested Within State

The LOGISTIC Procedure

Model Information

Data Set	WORK.BEFOREAFTER
Response Variable (Events)	Events
Response Variable (Trials)	Trials
Number of Observations	44
Link Function	Logit
Optimization Technique	Fisher's scoring

Response Profile

Ordered Outcome	Binary Outcome	Total Frequency
Event		40206
Nonevent		105209

Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	171477.98	170851.95
SC	171487.87	171079.36
-2 Log L	171475.98	170805.95

Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	670.0338	22	<.0001
Score	662.2528	22	<.0001
Wald	657.1045	22	<.0001

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8360	0.0191	1921.0310	<.0001
ca	1	-0.1221	0.0336	13.1810	0.0003
on	1	-0.2251	0.0340	43.9617	<.0001
ia	1	-0.1165	0.0334	12.1519	0.0005

ma	1	-0.1790	0.0338	27.9818	<.0001
nj	1	-0.3940	0.0353	124.7281	<.0001
nm	1	0.0592	0.0327	3.2808	0.0701
ny1	1	-0.0714	0.0333	4.6111	0.0318
ny2	1	-0.1880	0.0339	30.8185	<.0001
nc	1	-0.1904	0.0339	31.5794	<.0001
or	1	-0.0388	0.0331	1.3697	0.2419
time	1	-0.1589	0.0296	28.8332	<.0001
ca*InterventionCity	1	0.00638	0.0393	0.0264	0.8710
on*InterventionCity	1	-0.1436	0.0406	12.5396	0.0004
ia*InterventionCity	1	0.0983	0.0385	6.5063	0.0107
ma*InterventionCity	1	0.0632	0.0394	2.5691	0.1090
nj*InterventionCity	1	-0.0830	0.0427	3.7808	0.0518
nm*InterventionCity	1	0.1365	0.0373	13.4162	0.0002
ny1*InterventionCity	1	-0.0155	0.0388	0.1605	0.6887
ny2*InterventionCity	1	0.0391	0.0395	0.9810	0.3220
nc*InterventionCity	1	0.1569	0.0390	16.1409	<.0001
or*InterventionCity	1	0.0388	0.0383	1.0287	0.3105
intervention	1	0.0621	0.0414	2.2469	0.1339

#### Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
time	0.858	0.805	0.904
intervention	1.061	0.981	1.154

#### Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.0	Somers' D	0.085
Percent Discordant	42.5	Gamma	0.091
Percent Tied	6.5	Tau-a	0.034
Pairs	4230033054	c	0.542

InterventionCity is the interaction affect since the analysis is conducted separately for each time period  
InterventionCity is Nested in State  
Shows before the intervention study

# The LOGISTIC Procedure

## Model Information

Data Set	WORK.BEFOREAFTER
Response Variable (Events)	Events
Response Variable (Trials)	Trials
Number of Observations	22
Link Function	Logit
Optimization Technique	Fisher's scoring

## Response Profile

Ordered Value	Binary Outcome	Total Frequency
1	Event	36792
2	Nonevent	95208

## Model Convergence Status

Convergence criterion (GCONV=1E-8) satisfied.

## Model Fit Statistics

Criterion	Intercept Only	Intercept and Covariates
AIC	156223.28	155567.52
SC	156233.07	155773.12
-2 Log L	156221.28	155525.52

## Testing Global Null Hypothesis: BETA=0

Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	695.7591	20	<.0001
Score	686.0739	20	<.0001
Wald	679.6098	20	<.0001

## Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Chi-Square	Pr > ChiSq
Intercept	1	-0.8118	0.0198	1684.1342	<.0001

ca	1	-0.1576	0.0350	20.2305	<.0001
on	1	-0.2550	0.0356	51.3593	<.0001
ia	1	-0.1227	0.0348	12.4031	0.0004
ma	1	-0.2289	0.0354	41.7517	<.0001
nj	1	-0.4595	0.0370	154.6160	<.0001
nm	1	0.0442	0.0341	1.6861	0.1941
ny1	1	-0.1080	0.0348	9.6393	0.0019
ny2	1	-0.2083	0.0353	34.7974	<.0001
nc	1	-0.2032	0.0353	33.1600	<.0001
or	1	-0.0450	0.0345	1.7052	0.1916
caInterventionCity	1	0.0249	0.0408	0.3741	0.5408
onInterventionCity	1	-0.1470	0.0426	11.8858	0.0006
iaInterventionCity	1	0.0920	0.0402	5.2426	0.0220
maInterventionCity	1	0.0764	0.0412	3.4360	0.0638
njInterventionCity	1	-0.0836	0.0447	3.4977	0.0615
nmInterventionCity	1	0.1442	0.0388	13.8352	0.0002
ny1InterventionCity	1	-0.0247	0.0406	0.3700	0.5430
ny2InterventionCity	1	0.0153	0.0413	0.1381	0.7102
ncInterventionCity	1	0.1486	0.0407	13.3541	0.0003
orInterventionCity	1	0.0520	0.0397	1.7173	0.1900

#### Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
ca	0.854	0.798	0.915
on	0.775	0.723	0.831
ia	0.885	0.826	0.947
ma	0.795	0.742	0.853
nj	0.632	0.587	0.679
nm	1.045	0.978	1.117
ny1	0.898	0.839	0.961
ny2	0.812	0.758	0.870
nc	0.816	0.762	0.875
or	0.956	0.894	1.023
caInterventionCity	1.025	0.947	1.111
onInterventionCity	0.863	0.794	0.939
iaInterventionCity	1.096	1.013	1.186
maInterventionCity	1.079	0.996	1.170
njInterventionCity	0.920	0.843	1.004
nmInterventionCity	1.155	1.071	1.246
ny1InterventionCity	0.976	0.901	1.056
ny2InterventionCity	1.015	0.937	1.101
ncInterventionCity	1.160	1.071	1.256
orInterventionCity	1.053	0.975	1.139

#### Association of Predicted Probabilities and Observed Responses

Percent Concordant	51.7	Somers' D	0.088
Percent Discordant	42.9	Gamma	0.093
Percent Tied	5.4	Tau-a	0.035
Pairs	3502892736	c	0.544

The afterCount used in the Logistic Regression

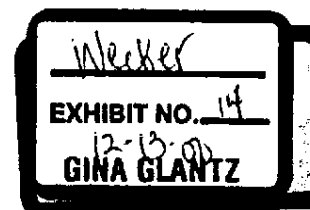
community	
Hayward	537
Vallejo	550
Peterborough	695
Brantford	754
Cedar Rapids	684
Davenport	661
Lowell	601
Fitchburg/Leominster	558
Patterson	450
Trumbull	526
Lafayette	628
Santa Fe	612
Yonkers	569
New Rochelle	620
Utica	673
Binghamton/Johnson City	620
Greensboro	612
Raleigh	638
Medford/Ashland	597
Albany/Corvallis	615
Bellamyham	597
Longview/Kelso	618

The replication of the Cummings 1.8%

commit	percent
control	10194 0.246703
treatment	10153 0.264726

The Percentages That Go Into the Logistic Regression

COMCODE	commit	weighted Percent
1.00	control	0.272804
2.00	treatment	0.242963
3.00	control	0.237084
4.00	treatment	0.226749
5.00	treatment	0.257236
6.00	control	0.214855
7.00	control	0.285627
8.00	treatment	0.285905
9.00	treatment	0.289748
10.00	control	0.281444
11.00	control	0.262309



52614 1008

produced by RJRT  
in  
HUMPHREY

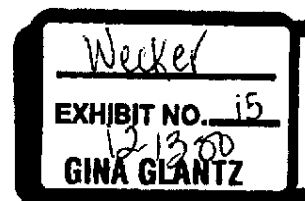
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15.00	treatment	0.288603
16.00	control	0.228078
17.00	control	0.212261
18.00	treatment	0.269125
19.00	treatment	0.216584
20.00	control	0.225494
21.00	treatment	0.23723
22.00	control	0.21384

## Harris Report 7 Replication

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	232	18	78	50	143	41	95
1997	852	429	601	587	1165	1252	1024	1278
1998	1408	709	2386	2054	3823	3854	3811	4540
1999	2265	1140	16423	13102	24116	23044	8291	12334
2000	2960	1490	15359	12370	24575	23477	10674	14726
TOTAL	7945	4000	34787	28191	53729	51770	23841	32973
1992	14	7	1	3	0	3	0	2
1993	17	9	2	4	0	4	0	2
1994	555	279	6	82	3	122	0	59
1995	933	470	44	165	30	230	21	126
1996	1612	811	1803	1006	3356	3349	3722	4293
1997	2405	1210	4262	3654	7262	7236	5453	6783
1998	2111	1062	3067	3383	6992	6909	5907	7153
1999	2653	1335	22284	17719	35603	33666	12023	17725
2000	3685	1855	20135	16190	30318	29095	13653	18773
TOTAL	19985	7038	51764	42206	83564	80614	40779	54916
CF - BL		6947		9498		2950		

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## Harris Report 7 Replication

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
2000	1856	846	6315	5019	10105	9713	5848	7820
2001	1836	837	6248	4965	9997	9609	5782	7733
2002	1807	824	6155	4891	9848	9465	5692	7614
2003	1773	809	6042	4801	9667	9291	5583	7470
2004	1735	791	5913	4699	9461	9093	5460	7306
2005	1692	771	5774	4588	9238	8878	5327	7129
2006	1580	721	5300	4215	8477	8153	4517	6174
2007	1487	678	4920	3916	7865	7570	3911	5451
2008	1435	654	4751	3781	7594	7309	3752	5239
2009	1381	630	4573	3639	7309	7035	3587	5018
2010	1324	604	4386	3491	7011	6748	3414	4787
2011	1265	577	4193	3337	6700	6449	3237	4549
2012	1205	549	3993	3178	6382	6142	3056	4306
2013	1142	521	3790	3016	6056	5828	2873	4059
2014	1080	492	3584	2852	5726	5511	2690	3811
2015	1016	463	3377	2687	5395	5192	2508	3564
2016	954	435	3171	2524	5066	4875	2328	3320
2017	893	407	2969	2362	4741	4563	2154	3083
2018	832	379	2769	2203	4422	4256	1985	2851
2019	773	352	2576	2049	4113	3958	1823	2628
2020	716	326	2388	1900	3813	3669	1668	2415
2021	662	302	2208	1756	3524	3391	1522	2212
2022	609	277	2035	1619	3247	3125	1383	2019
2023	559	255	1869	1487	2982	2870	1252	1836
2024	510	233	1719	1360	2729	2625	1129	1663
2025	465	212	1572	1240	2486	2392	1013	1500
2026	421	192	1415	1125	2256	2170	905	1346
2027	379	173	1279	1016	2038	1960	803	1202
2028	341	156	1150	915	1834	1764	711	1070
2029	305	140	1022	820	1644	1581	627	948
2030	272	123	922	733	1469	1413	550	837
2031	242	110	830	652	1306	1257	481	736
2032	214	97	746	577	1157	1113	417	644
2033	188	86	640	508	1018	979	361	560
2034	163	74	559	443	889	854	308	482
2035	141	64	482	383	767	737	260	410
2036	119	54	411	326	653	628	217	344
2037	99	45	345	273	548	526	178	285
2038	82	37	285	226	452	435	143	231
2039	67	30	231	183	367	353	113	184
2040	52	24	184	146	293	281	88	145
2041	41	19	143	115	230	221	67	111
2042	31	14	112	89	178	171	50	84
2043	24	11	89	68	135	130	37	63
2044	17	8	65	51	102	98	27	47
2045	13	6	48	38	76	73	20	34
2046	9	4	36	28	56	54	14	25
2047	7	3	26	21	41	39	10	18
2048	5	2	19	15	30	29	7	12
2049	3	1	14	11	22	21	5	9
TOTAL	33818	15421	113593	90336	181512	174599	89889	125385

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	232	18	78	50	143	41	95
1997	852	429	601	587	1165	1252	1024	1278
1998	1408	709	2386	2054	3823	3854	3811	4540
1999	2265	1140	16423	13102	24116	23044	8291	12334
2000	2960	1490	15359	12370	24575	23477	10674	14726
TOTAL	7945	4000	34787	28191	53729	51770	23841	32973
1992	14	7	1	3	0	3	0	2
1993	17	9	2	4	0	4	0	2
1994	555	279	6	82	3	122	0	59
1995	933	470	165	165	30	230	21	126
1996	612	811	1006	1006	3356	3349	3722	4293
1997	2405	1210	4262	3654	7262	7236	5453	6783
1998	11	1062	3967	3383	6992	6909	5907	7153
1999	2553	1335	22254	17719	35603	33666	12023	17725
2000	1665	1855	16190	16190	30318	29095	13653	18773
TOTAL	3985	7038	51761	42206	83564	80614	40779	54916
CF - BL		6947		9498		2950		

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year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
2000	1856	846	6315	5019	10105	9713	5848	7820
2001	1836	837	6248	4965	9997	9609	5782	7733
2002	1807	824	6155	4891	9848	9465	5692	7614
2003	1773	809	6042	4801	9667	9291	5583	7470
2004	1735	791	5913	4699	9461	9093	5460	7306
2005	1692	771	5774	4588	9238	8878	5327	7129
2006	1580	721	5300	4215	8477	8153	4517	6174
2007	1487	678	4920	3916	7865	7570	3911	5451
2008	1435	654	4751	3781	7594	7309	3752	5239
2009	1381	630	4573	3639	7309	7035	3587	5018
2010	1324	604	4386	3491	7011	6748	3414	4787
2011	1265	577	4193	3337	6700	6449	3237	4549
2012	1205	549	3993	3178	6382	6142	3056	4306
2013	1142	521	3790	3016	6056	5828	2873	4059
2014	1080	492	3584	2852	5726	5511	2690	3811
2015	1016	463	3377	2687	5395	5192	2508	3564
2016	954	435	3171	2524	5066	4875	2328	3320
2017	893	407	2968	2362	4741	4563	2154	3083
2018	832	379	2765	2203	4422	4256	1985	2851
2019	773	352	2576	2049	4113	3958	1823	2628
2020	716	326	2388	1900	3813	3669	1668	2415
2021	652	302	2208	1756	3524	3391	1522	2212
2022	609	277	2045	1619	3247	3125	1383	2019
2023	559	255	1869	1487	2982	2870	1252	1836
2024	510	233	1710	1360	2729	2625	1129	1663
2025	465	212	1559	1240	2486	2392	1013	1500
2026	421	192	1415	1125	2256	2170	905	1346
2027	379	173	1278	1016	2038	1960	803	1202
2028	341	156	1150	915	1834	1764	711	1070
2029	305	139	1032	820	1644	1581	627	948
2030	272	124	922	733	1469	1413	550	837
2031	242	110	820	652	1306	1257	481	736
2032	214	97	726	577	1157	1113	417	644
2033	188	85	643	508	1018	979	361	560
2034	163	74	558	443	889	854	308	482
2035	141	64	483	383	767	737	260	410
2036	119	54	411	326	653	628	217	344
2037	99	45	348	273	548	526	178	285
2038	82	37	285	226	452	435	143	231
2039	67	30	231	183	367	353	113	184
2040	52	24	184	146	293	281	88	145
2041	41	19	145	115	230	221	67	111
2042	31	14	112	89	178	171	50	84
2043	24	11	88	68	135	130	37	63
2044	17	8	65	51	102	98	27	47
2045	13	6	48	38	76	73	20	34
2046	9	4	36	28	56	54	14	25
2047	7	3	26	21	41	39	10	18
2048	5	2	19	15	30	29	7	12
2049	3	1	14	11	22	21	5	9
TOTAL	33818	15421	113593	90336	181512	174599	89889	125385

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	408	18	34	50	71	41	51
1997	852	757	601	607	1165	1190	1024	1070
1998	1408	1250	2386	2336	3823	3849	3811	3941
1999	2265	2011	16423	15811	24116	23988	8291	9007
2000	2960	2628	15359	14817	24575	24446	10674	11392
TOTAL	7945	7054	34787	33605	53729	53544	23841	25461
1992	14	12	1	1	0	1	0	0
1993	17	15	2	3	0	1	0	0
1994	555	493	6	26	3	30	0	11
1995	933	829	43	76	30	75	21	40
1996	1612	1431	1003	1019	3356	3373	3722	3825
1997	2405	2136	4262	4170	7262	7292	5453	5690
1998	2111	1875	3967	3876	6992	7008	5907	6129
1999	2553	2356	22284	21438	35603	35339	12023	13032
2000	3685	3272	20133	19418	30318	30187	13653	14560
TOTAL	3985	12419	51134	50027	83564	83306	40779	43287
CF - BL		1566		1677		258		

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year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	435	18	26	50	60	41	46
1997	852	807	601	604	1165	1177	1024	1045
1998	1408	1333	2386	2364	3823	3836	3811	3871
1999	2265	2144	16423	16140	24116	24060	8291	8621
2000	2960	2802	15359	15109	24575	24519	10674	11005
TOTAL	7945	7521	34787	34243	53729	53652	23841	24588
1992	14	13	1	1	0	0	0	0
1993	17	16	2	2	0	0	0	0
1994	55	525	6	16	3	16	0	5
1995	933	883	44	60	30	51	21	30
1996	1612	1526	189	1012	3356	3365	3722	3769
1997	2405	2277	4262	4221	7262	7278	5453	5562
1998	3111	1998	3967	3926	6992	7001	5907	6009
1999	2553	2512	22284	21892	35603	35485	12023	12489
2000	3685	3489	19135	19804	30318	30262	13653	14072
TOTAL	3985	13239	70	50934	83564	83458	40779	41936
CF - BL		746		770		106		

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in

HUMPHREY

Harris Report 7 Replication  
with R2 changed 3 to 1.0  
and r2 changed 0.7 to 1.0  
and R1 changed 1.5 to 1.0

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	450	18	21	50	54	41	43
1997	852	834	601	602	1165	1170	1024	1032
1998	1408	1378	2386	2377	3823	3828	3811	3834
1999	2265	2217	16423	16312	24116	24096	8291	8420
2000	2860	2898	15359	15261	24575	24555	10674	10803
TOTAL	7945	7777	34787	34573	53729	53703	23841	24132
1992	14	14	1	1	0	0	0	0
1993	17	17	2	2	0	0	0	0
1994	55	543	6	10	3	8	0	2
1995	933	913	44	50	30	38	21	24
1996	1612	1578	1007	1007	3356	3360	3722	3740
1997	2405	2354	4262	4246	7262	7269	5453	5496
1998	3111	2067	3967	3951	6992	6996	5907	5947
1999	2553	2597	22284	22131	35603	35559	12023	12205
2000	3685	3608	20006	20006	30318	30298	13653	13816
TOTAL	3985	13691	51404	51404	83564	83528	40779	41230
CF - BL		294		300		36		

Harris Report 7 Replication  
with R2 changed 3 to 1.0  
and r2 changed 0.7 to 1.0  
and R1 changed 1.5 to 1.0  
and r1 changed 0.9 to 1.0

year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	460	18	18	50	50	41	41
1997	852	852	601	601	1165	1165	1024	1024
1998	1408	1408	2386	2386	3823	3823	3811	3811
1999	2265	2265	16423	16423	24116	24116	8291	8291
2000	2960	2960	15359	15359	24575	24575	10674	10674
TOTAL	7945	7945	34787	34787	53729	53729	23841	23841
1999	14	14	1	1	0	0	0	0
1993	17	17	2	2	0	0	0	0
1994	555	555	6	6	3	3	0	0
1995	933	933	44	44	30	30	21	21
1996	1612	1612	1003	1003	3356	3356	3722	3722
1997	2405	2405	4262	4262	7262	7262	5453	5453
1998	2111	2111	3967	3967	6992	6992	5907	5907
1999	2653	2653	22284	22284	35603	35603	12023	12023
2000	3685	3685	20135	20135	30318	30318	13653	13653
TOTAL	13985	13985	51704	51704	83564	83564	40779	40779
CF - BL	0	0	0	0	0	0	0	0

52614 1017

Harris 5,  
9/28/00

JEFFREY E. HARRIS MD PHD  
52 HEDGE ROAD  
BROOKLINE MA 02445-7551  
(617) 277-1024

September 27, 2000

Laurie S. Dix  
Orrick Herrington & Sutcliffe LLP  
666 Fifth Avenue  
New York NY 10103-0001

RE: Falise, et al. v. American Tobacco Co., et al.

Dear Ms. Dix:

At your request, I am attaching charts that display the numbers of claims by year and diagnosis in the baseline and median counterfactual scenarios.

I generated the charts by running the programs *dm5* and *dm6*, with the modification that input file *ms8a* replaced *ms7a*. The files *dm5.do*, *dm6.do* and *ms7a.dta* were previously provided in *Harris Manville Trust Report 6.zip* on June 14, 2000. The file *ms8a.dta* and supporting documentation was previously provided in *Harris HK Porter Report 1.zip* on August 23, 2000. As noted in my expert report in *HK Porter*, dated August 21, 2000, the file *ms8a.dta* was generated under the assumption of no post-2000 misconduct in order to comply with the Court's Daubert ruling. Although the attached tables show only the median counterfactual estimates, the ranges can also be readily computed from the above-noted, previously supplied programs and data.

Sincerely,



Jeffrey E. Harris

Enclosure

52614 1018

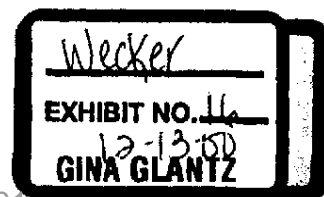




Table 1. Past Claims in the Baseline and Median Counterfactual Scenarios under RICO

Year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	460	232	18	78	50	143	41	95
1997	852	429	601	587	1,165	1,252	1,024	1,278
1998	1,408	709	2,386	2,054	3,823	3,854	3,811	4,540
1999	2,265	1,140	16,423	13,102	24,116	23,044	8,291	12,334
2000	2,960	1,490	15,359	12,370	24,575	23,477	10,674	14,726

Table 2. Past Claims in the Baseline and Median Counterfactual Scenarios under SFA

Year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
1992	14	7	1	3	0	3	0	2
1993	17	9	2	4	0	4	0	2
1994	555	279	6	82	3	122	0	59
1995	933	470	44	165	30	230	21	126
1996	1,612	811	1,003	1,006	3,356	3,349	3,722	4,293
1997	2,405	1,110	4,262	3,654	7,262	7,236	5,453	6,783
1998	2,111	1,062	3,967	3,383	6,992	6,909	5,907	7,153
1999	2,653	1,335	22,284	17,719	35,603	33,666	12,023	17,725
2000	3,685	1,855	20,135	16,190	30,318	29,095	13,653	18,773

Table 3. Future Claims in the Baseline and Median Counterfactual Scenarios under SFA and RICO

Year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
2000	1,856	845	6,315	5,019	10,105	9,713	5,848	7,820
2001	1,836	837	6,248	4,965	9,997	9,609	5,782	7,733
2002	1,807	824	6,155	4,891	9,848	9,465	5,692	7,614
2003	1,773	809	6,042	4,801	9,667	9,291	5,583	7,470
2004	1,734	791	5,913	4,699	9,461	9,093	5,460	7,306
2005	1,692	771	5,774	4,588	9,238	8,878	5,327	7,129
2006	1,580	721	5,300	4,215	8,476	8,153	4,517	6,174
2007	1,486	678	4,920	3,916	7,865	7,570	3,911	5,451
2008	1,435	654	4,750	3,781	7,594	7,309	3,752	5,239
2009	1,381	630	4,573	3,639	7,309	7,035	3,586	5,018
2010	1,324	604	4,386	3,491	7,011	6,748	3,414	4,787
2011	1,265	577	4,192	3,337	6,700	6,449	3,237	4,549
2012	1,205	549	3,993	3,178	6,382	6,142	3,056	4,306
2013	1,142	521	3,790	3,016	6,056	5,828	2,873	4,059

Table 3 Continued. Future Claims in the Baseline and Median Counterfactual Scenarios under SFA and RICO

Year	Lung Cancer		Disabling BID		Non-Disabling BID		Pleural Injury	
	BL	CF	BL	CF	BL	CF	BL	CF
2014	1,080	492	3,584	2,852	5,726	5,511	2,690	3,811
2015	1,016	463	3,377	2,687	5,395	5,192	2,508	3,564
2016	954	435	3,171	2,524	5,066	4,875	2,328	3,320
2017	893	407	2,968	2,362	4,741	4,563	2,154	3,083
2018	832	379	2,769	2,203	4,422	4,256	1,985	2,851
2019	773	352	2,576	2,049	4,113	3,958	1,823	2,628
2020	716	326	2,388	1,900	3,813	3,669	1,668	2,415
2021	662	302	2,208	1,756	3,524	3,391	1,522	2,212
2022	608	277	2,035	1,619	3,247	3,125	1,383	2,019
2023	559	255	1,869	1,487	2,982	2,870	1,252	1,836
2024	510	233	1,710	1,360	2,728	2,625	1,128	1,663
2025	465	212	1,559	1,240	2,486	2,392	1,013	1,500
2026	421	192	1,414	1,125	2,256	2,170	904	1,346
2027	379	172	1,278	1,016	2,038	1,960	803	1,202
2028	341	156	1,150	915	1,834	1,764	711	1,070
2029	305	139	1,032	820	1,644	1,581	626	948
2030	272	124	922	733	1,468	1,413	550	837
2031	242	110	820	652	1,306	1,257	481	736
2032	214	92	726	577	1,157	1,113	417	644
2033	188	76	640	508	1,018	979	361	560
2034	163	74	558	443	889	854	308	482
2035	141	64	482	383	767	737	260	410
2036	119	54	411	326	653	628	217	344
2037	99	45	344	273	548	526	178	285
2038	82	37	284	226	452	435	143	231
2039	66	30	231	183	367	353	113	184
2040	52	24	184	146	293	281	88	145
2041	41	19	145	115	230	221	66	111
2042	31	14	112	89	178	171	50	84
2043	24	11	85	68	135	130	37	63
2044	17	8	65	51	102	98	27	47
2045	13	6	48	38	76	73	20	34
2046	9	4	36	28	56	54	14	25
2047	7	3	26	21	41	39	10	18
2048	5	2	19	15	30	29	7	12
2049	3	1	14	11	22	21	4	9

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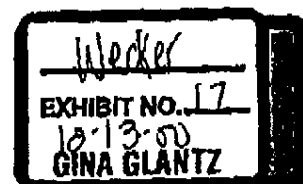
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0.9790	0.0000	0.0000	0.0000
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**Supplement to Expert Witness Report**

**Prepared by: K. Michael Cummings, Ph.D., MPH**

**in reference to:**

**Falisse, et al. v. The American Tobacco Company, et al.**

**September 22, 2000**



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## 1. Basis of Opinions

1.1 This supplemental report outlines my opinions on the subject of how blue collar workers responded to information and misinformation on smoking and how this information impacted smoking behavior (uptake and cessation). The term blue collar workers includes persons employed in following general occupational categories: precision production, craftsmen, repair occupations, machine operators, assemblers, inspectors, transportation and material moving occupations, handlers, equipment cleaners, helpers and laborers.<sup>1</sup>

1.2 The vast majority of the Manville Trust's claimants are male. Most are blue collar workers occupationally exposed to asbestos.<sup>2</sup>

1.3 The opinions stated in this report are based on my own personal research and years of professional experience in conducting prevention and stop smoking programs. In my 20 year research career, I have conducted several smoking cessation studies that have involved large numbers of blue collar smokers. In addition, as part of my duties in directing the Tobacco Control Program at Roswell Park Cancer Institute I have personally conducted dozens of lectures and stop smoking programs for thousands of blue collar employees located in the Western New York region. I have conducted programs for auto mechanics, truck drivers, auto workers, chemical factory workers, steel industry employees, warehouse workers, policemen and prison guards, and military personnel. Below is a partial listing of locations where I have conducted tobacco education programs for blue collar workers, some of whom were occupationally exposed to asbestos.

Buffalo China	General Motors Tonawanda Engine Plant
Mentholatum Company	New York State Department of Transportation
Rich Products	DuPont De Nemours EI & Company
Bethlehem Steel	Wyoming County Correctional Facility
Tops Supermarkets	United States Coast Guard
Buffalo Police Department	Niagara Falls Air Force Base

<sup>1</sup>Bureau of the Census Classified Index of Industries and Occupations. Appendix B. Occupational Classifications, 1990.

<sup>2</sup>Personal communication re: The Trust's Claims Population. August, 1999.

In addition, I have studied the scientific literature on smoking, smoking cessation, diseases related to smoking, addiction, cigarette design, and the history of medical knowledge related to smoking and consumer awareness and risk perceptions regarding smoking. I have also personally collected and reviewed thousands of tobacco industry documents. In addition, I have collected and reviewed cigarette advertisements and examples of cigarette product marketing. I have published and presented numerous scientific papers on the subject of cigarette product marketing, product design, consumer awareness and risk perceptions, tobacco use epidemiology, smoking cessation, and the impact of programs and methods to help people stop smoking.

Data from the Community Intervention Trial of Smoking Cessation (COMMIT) are included in this report since many of the participants in this study were blue collar workers.<sup>3</sup> The COMMIT study is the largest randomized community intervention study on smoking behavior ever undertaken. The study was funded by the National Cancer Institute. The COMMIT study involved assigning one community within each of 11 matched community pairs to receive a comprehensive educational intervention lasting four years while the other 11 communities served as an untreated control group. The study involved tracking the smoking behavior of over 20,000 smokers between 1988 and 1993. I was involved in the COMMIT study from its inception in 1986 when Roswell Park was selected as one of 11 participating research centers to plan and implement the study. I served as Chairman of the Design and Evaluation subcommittee for the study and therefore I am very familiar with the data collected as part of the study.

My expertise on these subjects has been acknowledged by others including those in the public health field who have called upon me to serve on expert committees, provide consultation on projects, and review grants, scientific manuscripts, and reports. I serve as the Deputy Editor for *Tobacco Control*, one of the leading scientific journals in the field.<sup>4</sup> I have received several awards for my community service and research on tobacco.

<sup>3</sup>COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): summary of design and intervention. JNCI 1991, 83:1620-1628.

<sup>4</sup><http://tc.bmjournals.com/misc/edboard.shtml>

## 2. Summary list of opinions

2.1 The opinions express in this report are listed below. Subsequent sections of this report summarize the bases for these opinions.

- Blue collar workers start smoking earlier than white collar workers;
- When blue collar workers first start smoking they are not usually thinking about future consequences and health risks;
- Blue collar workers have a higher smoking prevalence rate, report smoking more cigarettes per day, and have more total pack years of exposure to cigarette smoke compared to workers in other occupational groups;
- Blue collar workers have been deliberately exposed to cigarette advertising and promotions;
- The majority of blue collar smokers express the desire to stop smoking but fail more often in efforts to stop smoking compared to workers in other occupational groups;
- Compared to persons in other occupational groups blue collar workers are more likely to be misinformed about the health risks of cigarette smoking and the health benefits gained from quitting smoking;
- Beliefs about the health risks of smoking and benefits of stopping smoking are predictive of smoking behavior in blue collar smokers;
- Cigarette companies have never informed blue collar workers about the risks of smoking; and
- Educating blue collar workers about the health risks of smoking and benefits of smoking cessation influences smoking behavior.

2. Blue collar workers report starting smoking earlier than white collar workers

- 2.1 Data from the 1997 National Health Interview Survey [NHIS] show that among both adult (18 and older) current and former smokers proportionately more blue collar workers reported smoking regularly at earlier ages than did white collar workers.<sup>5</sup> Among blue collar workers, 31.2% reported smoking regularly before age 16 and 57.9% reported starting smoking regularly by age 18 years. Data collected as part of the COMMIT baseline survey in 1988 found similar results, i.e., the majority of blue collar smokers report beginning their smoking careers as teenagers and compared to other occupations, blue collar workers tend to begin smoking regularly at earlier ages.<sup>6</sup>

<u>Occupational Group</u>	<u>&lt;=15 yrs</u>	<u>16-19 yrs</u>	<u>&gt;=20yrs</u>
	%	%	%
Blue Collar (n=4586)	31	48	21
Professional (n=3753)	19	50	31
Clerical/sales (n=3182)	21	50	29

- 2.2 The Institute of Medicine Report (IOM) on nicotine addiction and youth reported that those who become addicted to tobacco at a younger age are the most likely to remain addicted and eventually experience health problems attributable to their use of tobacco products.<sup>7</sup>

3. When blue collar workers first start smoking they are not usually thinking about future consequences and health risks

- 3.1 The 1994 IOM report noted that decisions to engage in risky behaviors, like cigarette smoking, often "reflect a distinctive focus on short-term benefits and an accompanying tendency to discount long-term risks or dangers, and to believe that those risks can be controlled by personal choice."<sup>8</sup> According to the IOM report, the issue is not one of general knowledge (i.e., smoking is linked to lung cancer), but the difficulty that many

<sup>5</sup>Giovino GA, Pederson LL, Trosclair A. The prevalence of selected cigarette smoking behavior by occupational class in the United States. Draft report 7/20/00.

<sup>6</sup>COMMIT 1988 Baseline Survey.

<sup>7</sup>Lynch BS, Bonnie RJ. Growing Up Tobacco Free. Washington, D.C.: National Academy Press, 1994.

<sup>8</sup>Lynch BS, Bonnie RJ. Growing Up Tobacco Free. Washington, D.C.: National Academy Press, 1994.



people have envisioning long-term consequences and appreciating the personal relevance of these consequences.<sup>9</sup> Paul Slovic in his research on adolescent risk assessment of smoking found that a "high percentage of adolescent smokers see no health risk from smoking the next cigarette or from smoking regularly for a few years."<sup>10</sup>

3.2 Slovic also has found that the majority of adult smokers responded "not at all" when asked: "When you first started to smoke, how much did you think about how smoking might affect your health?"<sup>11</sup> When asked: "When you first started smoking, did you think more about how smoking would affect your future health or about how you were trying something new?", the majority of smokers responded "thought about trying something new and exciting."<sup>12</sup> Thus, it appears that many people believe they can escape the harmful consequences of smoking by stopping before health problems emerge. It is common for smokers to tell me that "I'm just smoking for the fun of it, I can quit anytime I want," or "I will stop smoking in a few years before I suffer any ill effects."

<sup>9</sup>Lynch BS, Bonnie RJ. Growing Up Tobacco Free. Washington, D.C.: National Academy Press, 1994.

<sup>10</sup>Slovic P. What does it mean to know a cumulative risk? Adolescents' perceptions of short-term and long term consequences of smoking. Journal of Behavioral Decision Making, 2000, 13:259-266.

<sup>11</sup>Slovic P. Rational actors and rational fools: The influence of affect on judgement and decision making. Paper prepared for the Symposium on The Implications of Psychology for Product Liability held at Roger Williams University School of Law, Bristol, Rhode Island, April 21, 2000.

<sup>12</sup>Slovic P. Rational actors and rational fools: The influence of affect on judgement and decision making. Paper prepared for the Symposium on The Implications of Psychology for Product Liability held at Roger Williams University School of Law, Bristol, Rhode Island, April 21, 2000.

3.3 When a person just begins smoking they do not necessarily think about how long they will be smoking.<sup>13</sup> Current smokers in the University of Michigan's longitudinal tracking study of high school seniors were asked: "Do you think you will be smoking cigarettes five years from now?" Among respondents who were occasional smokers (i.e., less than one cigarette per day), 85% predicted that they probably or definitely would not be smoking in five years, as did 32% of those who smoked one pack per day. However, in a follow-up study six years later of those who had smoked one pack per day, only 13% had quit and 70% still smoked one pack or more per day. Of those who smoked occasionally, 58% were no longer smoking, and 37% had actually increased their cigarette consumption.<sup>14</sup>

3.4 The majority of smokers say they would not start smoking again if they had to do over again.<sup>15</sup> Slovic found that 85% of adult smokers answered "no" to the question: "Smoking: Would you start again?" Regret about ever starting to smoking is expressed in a report for Imperial Tobacco Limited (affiliated with Brown & Williamson Tobacco Company) by Kwechansky Marketing Research, Inc., entitled: Project PlusMinus which involved a careful analysis of the smoking attitudes and habits of teenagers. The report concludes:

*"Starters no longer disbelieve the dangers of smoking, but they almost universally assume these risks will not apply to themselves because they will not become addicted. Once addiction does take place, it becomes necessary for the smoker to make peace with the accepted hazards. This is done by a wide range of rationalizations . . . The desire to quit seems to come earlier now than before, even prior to the end of high school. In fact, it often seems to take hold as soon as the recent starter admits to himself that he is hooked on smoking. However, the desire to quit, and actually carrying it out, are two quite different things, as*

<sup>13</sup>Slovic P. Rational actors and rational fools: The influence of affect on judgement and decision making. Paper prepared for the Symposium on The Implications of Psychology for Product Liability held at Roger Williams University School of Law, Bristol, Rhode Island, April 21, 2000.

<sup>14</sup>Lynch BS, Bonnie RJ. Growing Up Tobacco Free. Washington, D.C.: National Academy Press, 1994.

<sup>15</sup>Slovic P. Rational actors and rational fools: The influence of affect on judgement and decision making. Paper prepared for the Symposium on The Implications of Psychology for Product Liability held at Roger Williams University School of Law, Bristol, Rhode Island, April 21, 2000.

*the would-be quitter soon learns.*"<sup>16</sup>

4. Blue collar workers have a higher prevalence of smoking, report smoking more cigarettes per day, and have more total pack years of exposure to cigarette smoke compared to workers in other occupational groups

4.1 Among different occupational groups, blue collar workers have the highest prevalence of smoking.<sup>17 18</sup> Among workers exposed to asbestos a higher percentage (80% to 90%) report a history of cigarette smoking.<sup>19 20</sup> Trend data show that the gap in smoking prevalence between blue collar and white collar workers has widened over the past 20 years. In 1978-80, blue collar workers were 38% more likely to smoke cigarettes than white collar workers; by 1997 blue collar workers were 75% more likely to smoke than white collar workers<sup>21</sup>.

4.2 National surveys and the COMMIT study have found that blue collar smokers smoke more cigarettes per day compared to workers in other occupational groups.<sup>22</sup>

<sup>16</sup>Kweichow Marketing Research, Inc. Project Plus/Minus. Imperial Tobacco Limited. May 7, 1992. Bates Number: 566627751-566627824.

<sup>17</sup>Giovino GA, Pederson LL, Trosclair A. The prevalence of selected cigarette smoking behavior by occupational class in the United States. Draft report 7/20/00.

<sup>18</sup>Nelson DE, et al. Cigarette smoking prevalence by occupation in the United States. JOM 1994;26:516-525.

<sup>19</sup>For example, see March 3, 1985 Memo from Anthony Colucci to George Newton. Re: asbestos/smoking litigation. Bates 51583 8550.

<sup>20</sup>U.S. Department of Health and Human Services. The Health Consequences of Smoking: Cancer and Chronic Lung Disease in the Workplace. A Report of the Surgeon General. Rockville, Maryland: U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health, DHHS (PHS) 85-50207, 1985.

<sup>21</sup>Giovino GA, Pederson LL, Trosclair A. The prevalence of selected cigarette smoking behavior by occupational class in the United States. Draft report 7/20/00.

<sup>22</sup>Giovino GA, Pederson LL, Trosclair A. The prevalence of selected cigarette smoking behavior by occupational class in the United States. Draft report 7/20/00.

### Cigarettes per day<sup>23</sup>

<u>Occupational Group</u>	<u>&lt;=14</u>	<u>15-24</u>	<u>&gt;=25+</u>
	%	%	%
Blue Collar (n=4581)	19	36	45
Professional (n=3750)	25	33	42
Clerical/sales (n=3179)	25	36	39

- 4.3 Blue collar workers report more total pack years of exposure to cigarette smoke compared to workers in other occupational groups because they: a) initiate smoking earlier, b) have higher prevalence of smoking (especially among males), c) smoke more cigarettes per day, and d) and are less likely to stop smoking.<sup>24</sup>

### 5. Blue collar workers have been deliberately exposed to cigarette advertising and promotions

- 5.1 Cigarette companies have spent billions of dollars to advertise and promote their brands over the past half century making cigarettes among the most heavily advertised consumer products sold in the United States.<sup>25</sup>
- 5.2 Cigarette advertising for the brands popular with blue collar smokers have sometimes used images of blue collar smokers and/or activities that have appeal to blue collar workers (e.g., auto-racing, motorcycles).<sup>26</sup> Tobacco companies maintained information on the lifestyle activities, purchasing habits (including magazines), and

COMMIT 1988 Baseline Survey.

<sup>23</sup>U.S. Department of Health and Human Services. The Health Consequences of Smoking: Cancer and Chronic Lung Disease in the Workplace. A Report of the Surgeon General. Rockville, Maryland: U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health, DHHS (PHS) 85-50207, 1985; also see: Giovino GA, Pederson LL, Trosclair A. The prevalence of selected cigarette smoking behavior by occupational class in the United States. Draft report 7/20/00; and Nelson DE, et al. Cigarette smoking prevalence by occupation in the United States. JOM 1994; 36:516-525.

<sup>25</sup>Federal Trade Commission Report to Congress For 1998.

<sup>26</sup>For examples see Pollay slide collection.

cigarette brand preferences of blue collar and white collar workers.<sup>27 28 29</sup> Cigarette companies have even considered developing new product names like "Union-Made" or "Union-Label" targeted to blue collar union members, union families and union sympathizers.<sup>30</sup>

5.3 Data from the COMMIT study show that blue collar smokers are more likely than smokers in other occupational groups to report smoking Marlboro, Winston, Camel, Kool and Newport as their usual brand.<sup>31</sup>

Brand	<u>Blue Collar</u>		<u>Professional</u>		<u>Clerical/sales</u>	
	<u>1988</u>	<u>1993</u>	<u>1988</u>	<u>1993</u>	<u>1988</u>	<u>1993</u>
	%	%	%	%	%	%
Marlboro	22.0	17.9	16.9	15.8	18.5	15.3
Winston	10.9	7.0	8.5	6.3	9.3	6.7
Camel	6.1	5.4	4.6	4.3	3.7	2.8
Kool	4.5	3.5	3.8	2.8	4.2	3.7
Newport	3.5	3.7	3.3	2.9	3.2	3.0

Marlboro, Winston, Camel, Kool, and Newport have been among the most heavily advertised cigarette brands in the United States. These brands have also been found to be popular among younger, less educated, lower income smokers.<sup>32 33 34 35</sup>

<sup>27</sup>PM USA. Retail direct marketing: cluster A Wal-Mart Stores, Inc., Knoxville Market Suburban white/blue collar. Bates 2042009711.

<sup>28</sup>Summary of media habits by smoker segments. Bates 501301701 1718.

<sup>29</sup>March 13, 1989 Letter from Flair Communications to RJR regarding premiums targeted at 21 to 26 year old blue-collar smokers. Bates: 50883 7308.

<sup>30</sup>For example see: September 14, 1984 Lorillard Memo from MH Burke to TH Mau entitled "New Product Idea" Bates 91613630.

<sup>31</sup>COMMIT 1988 Baseline Survey and 1993 Endpoint Cohort Survey.

<sup>32</sup>CDC. Comparison of the cigarette brand preferences of adult and teenaged smokers-United States, 1989, 10 US Communities, 1988 and 1990. JAMA, 267:1893-1894, 1992.

<sup>33</sup>Cummings KM, et al. Comparison of recent trends in adolescent and adult cigarette smoking behaviour and brand preferences. Tobacco Control. 1997; 6(suppl: 2):S31-S37. Also, Cummings

- 5.4 Tobacco company documents reveal interest in tracking the habits of blue collar workers and discussion of marketing strategies to appeal to blue collar smokers. For example, a series of Philip Morris memos discuss how price increases might impact the smoking behavior of blue collar workers.<sup>36 37</sup>

A 1977 document from R.J. Reynolds Tobacco Company compares smoker preferences and perceptions of Marlboro and Winston. The document points out that smokers want a cigarette that has excellent taste, has as much tar and nicotine as other brands, and has an image that is masculine, rugged, *blue collar*, and modern. On these points, the author notes that Marlboro surpasses Winston. The document recommends repositioning Winston King's to have a more rugged, blue collar image.<sup>38</sup>

A 1980 R.J. Reynolds' document discusses a strategy to reinvigorate sagging Camel cigarette sales. The author notes that Camel smokers are viewed as masculine, rugged, and independent, but can also be viewed as "downscale, older, and more conservative." The document recommends that Camel marketing efforts be positioned to target men 18-34, blue collar, but not too downscale.<sup>39</sup>

- A series of mid-1980's RJR documents discuss a proposal for a blue collar volume program in Ohio that has as its objective increasing the volume of Winston and Salem among blue collar smokers. This objective was to be accomplished by extending the reach of intercept couponing to smaller blue collar industrialized markets, with an emphasis on reaching those missed by current distribution downtown and in-store.

KM, et al. Discrepancies in cigarette brand sales and adult market share: are new teen smokers filling the gap? Tobacco Control. 1997; 6(suppl. 2):S38-S43.

<sup>36</sup>RJR. Less Educated: Today's Trend, Tomorrow's Market? Bates No. 504617181-7241.

<sup>35</sup>Burrows D. Younger Adult Smoker: Strategies and Opportunities. (2/29/84) Bates: 501928462-501929550; Minnesota Trial Exhibit #: 12579.

<sup>36</sup>For example see: July 12, 1982 Memo from Myron Johnston to Harry Daniel on the "Effect of an excise tax increase on Philip Morris Sales." Bates 2058122235.

<sup>37</sup>Memo from HP Long Jr. To SP Pollack. Blue collar disposable income - 1970 to 1986. Bates 2043655450.

<sup>38</sup>Brand Positioning Statement. (11/1/77) Bates: 501188894-501188903.

<sup>39</sup>Camel Family Positioning Statement. (2/27/80) Bates: 500555223-50055226.

Intercept couponing at the following events were discussed: Winston sponsored events, state county, local fairs/festivals, auto shows, construction and industrial sites, flea markets, farmer markets, truck terminals, bowling leagues, wrestling matches, and softball tournaments.<sup>40</sup>

Since blue collar workers start smoking at an earlier age compared to those in other occupational groups, it is noteworthy that several of the cigarette companies acknowledge that their brands were popular with younger smokers.<sup>41 42</sup>

A series of memos on Lorillard's Harley-Davidson cigarette brand identifies the target audience as young adult males, blue collar with high school education.<sup>44 45</sup>

A 1985 Brown & Williamson document identifies blue collar young males as "prime prospects."<sup>46</sup>

A 1977 Brown and Williamson document discusses why the military market is important to B & W. The document states that the military is a large market for reaching adults 18-25, is the only market without recession, unemployment and pay cuts.<sup>47</sup>

<sup>40</sup>RJR Blue Collar Ohio Test Proposal Bates 50566 3765, 50560 4269-4275. (Note that there are a series of documents that reference this program - see list of Falise documents previously submitted)

<sup>41</sup>Achey TL. Subject: Product Information. (8/30/78) Bates: 03537131-03537132. Minnesota Trial Exhibit #: 10195.

<sup>42</sup>Cigarette Brand Switching Studies. (Undated; estimated 1984) bates: 665076894-665076916.

<sup>43</sup>Johnston M. Subject: Young Smokers - Prevalence, Trends, Implications and Related Demographic Trends. (3/31/81) Bates:1000390803-1000390855; Minnesota Trial Exhibit #: 10339.

<sup>44</sup>Harley Davidson Cigarette Creative Development Brief. Bates: 91377032-91377034.

<sup>45</sup>Harley Davidson Package Design II. Conclusions and Implications. Bates: 88499872-88499876.

<sup>46</sup>Subject: Cutter Tapes. (4/8/85) Bates:528010724-528010726.

<sup>47</sup>Nat Kornfield. Re: Military Market Importance to B&W Cigarette Sales.(9/7/77) Bates:680085619-680085620.

- 5.5 In the 1980's and 1990's branded discount and generic cigarettes were introduced into the marketplace. Research studies have established that changes (either up or down) in the price of cigarette can influence consumption.<sup>48</sup> This effect is more pronounced in young people and in those population groups with less disposal income. During the 1980's, Philip Morris was tracking the disposal income of blue collar workers and found that it was declining and very much tied to trends in employment.<sup>49</sup> Data from the COMMIT study show that blue collar smokers were more likely than smokers in other occupational groups to smoke generic cigarettes.<sup>50</sup>

Brand	<u>Blue Collar</u>		<u>Professional</u>		<u>Clerical/sales</u>	
	<u>1988</u>	<u>1993</u>	<u>1988</u>	<u>1993</u>	<u>1988</u>	<u>1993</u>
	%	%	%	%	%	%
Generic	6.3	15.0	4.7	11.2	5.5	12.8

In the COMMIT study use of discount and generic cigarettes was associated with lower household and higher daily cigarette consumption, and residence in an area with higher average cigarette prices.<sup>51</sup> All three of these characteristics (i.e., lower average incomes, heavier smokers, and residence in the Northeast where cigarette prices are higher because of taxes) are more common among blue collar workers. This study also found that respondents using discount or generic cigarettes were less likely to stop smoking or to reduce cigarette consumption between 1988 and 1993 compared with those who continued to use premium brand cigarettes.<sup>52</sup> Thus, the marketing strategy of offering discount and generic cigarettes made smoking more affordable which in turn helped the cigarette companies retain customers sensitive to price increases who might have otherwise reduced consumption or stop smoking altogether.

<sup>48</sup>National Cancer Institute. The impact of cigarette excise taxes on smoking among children and adults: summary report of a National Cancer Institute Expert Panel. Bethesda, Maryland: National Cancer Institute, 1993.

<sup>49</sup>Memo from HP Long Jr. To SP Pollack. Blue collar desposable income - 1970 to 1986. Bates 2043655450.

<sup>50</sup>COMMIT 1988 Baseline Survey and 1993 Endpoint Cohort Survey.

<sup>51</sup>Cummings KM, et al. Use of discount cigarettes by smokers in 20 communities in the United States, 1988-1993. Tobacco Control. 1997; 6(suppl: 2):S25-S30.

<sup>52</sup>Cummings KM, et al. Use of discount cigarettes by smokers in 20 communities in the United States, 1988-1993. Tobacco Control. 1997; 6(suppl: 2):S25-S30.



- 5.6 Since blue collar workers smoke the brands that are the most heavily advertised and brands which have been advertised to them as a group, one can conclude that the advertising has had an impact on the cigarette brand choices of blue collar smokers.<sup>53</sup>

6. The majority of blue collar smokers express the desire to stop smoking but fail more often in efforts to stop smoking compared to workers in other occupational groups

- 6.1 The 1988 COMMIT survey shows that the 65% of blue collar smokers express some desire to stop smoking.<sup>54</sup>

<u>Occupational Group</u>	<u>Desire to stop smoking</u>	
	<u>not at all/a little</u>	<u>Somewhat/ a lot</u>
	%	%
Blue Collar (n=4542)	35	65
Professional (n=3734)	30	70
Clerical/sales (n=3166)	31	69

- 6.2 Between 1988 and 1993, 75% of blue collar smokers in the COMMIT study reported making at least one serious attempt to stop smoking. However, compared to smokers in other occupational groups, blue collar smokers were less successful in stopping smoking.<sup>55</sup>

<u>Occupational Group</u>	<u>% quit</u>
	%
Blue Collar (n=4586)	22.7
Professional (n=3753)	26.2
Clerical/sales (n=3182)	24.2

- 6.3 In the COMMIT study most blue collar smokers reported a desire to stop smoking when surveyed in 1988, 3 out of 4 reported making at least one serious attempt to

U.S. Department of Health and Human Services. Reducing the Health Consequences of Smoking: 25 Years of Progress. Rockville, Maryland: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. DHHS (CDC)89-8411, 1989.

<sup>54</sup>COMMIT 1988 Baseline Survey.

<sup>55</sup>COMMIT 1993 Endpoint Cohort Survey.

stop smoking between 1988 and 1993, but only 30% of those who attempted to stop smoking were successful in stopping smoking over a five year period.<sup>56</sup> As a group, blue collar workers are less successful in stopping smoking because they initiate smoking at an earlier age and smoke more per day compared to persons in other occupational groups.<sup>57</sup>

7. Compared to persons in other occupational groups blue collar workers are more likely to be misinformed about the health risks of cigarette smoking and the health benefits gained from quitting smoking

7.1 Data from the 1989 COMMIT Evaluation Survey which assessed smoker's attitudes and beliefs about the health risks of smoking reveal that many smokers were misinformed about the relative health risks of cigarettes compared to other exposures (i.e., air pollution, alcohol, cocaine, being 20 pounds overweight). Blue collar smokers were more likely than smokers in other occupational groups to be misinformed about the risks of cigarette smoking.<sup>58</sup>

<u>Occupational Group</u>	<u>Air pollution more harmful than cigarettes</u>	
	<u>Agree</u>	<u>Disagree</u>
	%	%
Blue Collar (n=1278)	67	33
Professional (n=1053)	63	37
Clerical/sales (n=842)	67	33

<u>Occupational Group</u>	<u>Cigarettes less harmful than alcohol</u>	
	<u>Agree</u>	<u>Disagree</u>
	%	%
Blue Collar (n=1205)	47	53
Professional (n=983)	41	59
Clerical/sales (n=802)	45	55

<sup>56</sup>Hymowitz N, et al. Predictors of smoking cessation in a cohort of adult smokers followed for five years. Tobacco Control. 1997; 6(suppl: 2):S57-S62. Also see COMMIT 1993 Endpoint Cohort Survey.

<sup>57</sup>U.S. Department of Health and Human Services. The Health Consequences of Smoking: Cancer and Chronic Lung Disease in the Workplace. A Report of the Surgeon General. Rockville, Maryland: U.S. Department of Health and Human Services, Public Health Service, Office on Smoking and Health, DHHS (PHS) 85-50207, 1985.

<sup>58</sup>COMMIT 1989 Evaluation Cohort Survey.

<u>Occupational Group</u>	<u>More people die from cigarettes than cocaine</u>	
	<u>Agree</u>	<u>Disagree</u>
	%	%
Blue Collar (n=1161)	44	56
Professional (n=938)	54	46
Clerical/sales (n=782)	48	52

<u>Occupational Group</u>	<u>Cigarette smoking is more harmful than &gt;20lbs overweight</u>	
	<u>Agree</u>	<u>Disagree</u>
	%	%
Blue Collar (n=1216)	34	66
Professional (n=1008)	32	68
Clerical/sales (n=831)	33	67

7.2

Data from the 1989 COMMIT Evaluation Survey reveal that blue collar smokers were more likely to express pessimism about the benefits of stopping smoking compared to smokers in other occupational categories.<sup>59</sup>

<u>Occupational Group</u>	<u>There is little benefit from quitting smoking if a persons has smoked for &gt;20 +years</u>	
	<u>Agree</u>	<u>Disagree</u>
	%	%
Blue Collar (n=1285)	22	78
Professional (n=1096)	11	89
Clerical/sales (n=877)	11	89

<u>Occupational Group</u>	<u>Quitting will help me avoid serious health problems</u>	
	<u>Likely/very likely</u>	<u>unlikely/very unlikely</u>
	%	%
Blue Collar (n=1205)	80	20
Professional (n=991)	85	15
Clerical/sales (n=797)	84	16

<sup>59</sup>COMMIT 1989 Evaluation Cohort Survey.

8. Beliefs about the health risks of smoking and benefits of stopping smoking are predictive of smoking behavior in blue collar smokers

8.1 The Health Belief Model predicts that behavior change is more likely to occur in persons who perceive themselves to be susceptible to illness and believe that their susceptibility can be reduced by changing their behavior at a tolerable cost.<sup>60</sup>

8.2 A 1959 Roper Poll conducted for Philip Morris found that while many smokers perceived cigarettes as "bad for you", there was "surprising little concern about the health aspects of cigarettes."<sup>61</sup> According to the Roper report, concern about health "seems directed at the avoidance of throat irritation and the consequent search for mildness which seems to be a major asset of filters."<sup>62</sup> Beliefs about smoking as a cause of lung cancer have changed over time.<sup>63</sup> According to the Gallup Organization, in January 1954, 41% of people answered "yes" to the question "Do you think cigarette smoking is one of the causes of lung cancer, or not?" In September, 1999, 92% of people answered "yes" to this same question.<sup>64</sup> Eighty eight percent of blue collar smokers who reported making a quit attempt in the COMMIT study cited concern for health or future health as a reason for attempting to stop smoking. Despite the fact that nearly all smokers acknowledge today that smoking is a cause of lung disease, many optimistically believe that their personal risk of illness is no greater than average.<sup>65</sup> This optimistic bias appears to be especially strong for heavy smokers who over-estimated the odds that they would survive to age

<sup>60</sup>Rosenstock IM. The Health Belief Model: explaining health behavior through expectancies. In: Health Behavior and Health Education, 1990, pp. 39-62.

<sup>61</sup>Elmo Roper and Associates. Volume 1: A study of attitudes toward cigarette smoking and different types of cigarettes. January 1959.

<sup>62</sup>Elmo Roper and Associates. Volume 1: A study of attitudes toward cigarette smoking and different types of cigarettes. January 1959.

<sup>63</sup>Moore DE. Nine of ten Americans view smoking as harmful. Gallup Organization, October 7, 1999.

<sup>64</sup>Moore DE. Nine of ten Americans view smoking as harmful. Gallup Organization, October 7, 1999.

<sup>65</sup>Ayanian JZ, Cleary PD. Perceived risks of heart disease and cancer among cigarette smokers. JAMA 1999;281:1019-1021.

75.<sup>66</sup>

8.3 Between 1950 and 1980, many blue collar workers switched from unfiltered to filtered cigarettes under the belief that smoking a filtered cigarette is safer. The filtered cigarette was not a dominant factor in the market place before the 1950's.<sup>67</sup> By 1983, approximately 95% of the cigarettes sold in the United States contained filtered. The Federal Trade Commission report indicated that 98% of cigarettes sold in the United States in 1998 were filtered cigarettes.<sup>68</sup>

8.4 According to a 1959 Roper Poll conducted for Philip Morris, 54% of filtered cigarette smokers disagreed with the statement: "*Filtered tip cigarettes are no safer than non-filtered.*"<sup>69</sup> Remarkably this percentage has actually increased over the past 40 years. A convenience sample of current and former smokers interviewed at the Division of Motor Vehicles in Erie County, New York during the summer of 1997 found that 58% expressed the belief that filtered cigarettes were safer than unfiltered cigarettes.<sup>70</sup>

8.5 My experience in working with thousands of smokers coupled with my review of the scientific literature on consumer perceptions about cigarettes suggests to me that many blue collar smokers are unaware that when they switch from a unfiltered to a filtered cigarette or from a high tar and nicotine content cigarette to one that is lower in tar and nicotine this does not necessarily reduce their exposure to the harmful constituents found in tobacco smoke.<sup>71</sup> One of the main design features of cigarettes used to lower

<sup>66</sup>Schoebaum M. Do smokers understand the mortality effects of smoking? Evidence from the Health and Retirement Survey. *AJPH* 1997; 87:755-759.

<sup>67</sup>Hoffmann D., Hoffmann I. 1997. The changing cigarette, 1950-1995. *Journal of Toxicology and Environmental Health* 50:307-364.

<sup>68</sup>Federal Trade Commission Report to Congress for 1998 pursuant to the Federal Cigarette Labeling and Advertising Act. 2000.

<sup>69</sup>Elmo Roper and Associates. Volume 1: A study of attitudes toward cigarette smoking and different types of cigarettes. January 1959.

<sup>70</sup>Hastrup J, et al. Consumers beliefs about the safety of filters. Unpublished, 2000.

<sup>71</sup>Djordjevic M, Stellman SD, Zang E. Doses of nicotine and lung carcinogens delivered to cigarette smokers. *JNCI* 2000; 92:106-111.

tar and nicotine yields is vent holes in the filter.<sup>72</sup> Many smokers are unaware that the presence of these vent holes and unknowingly block them during smoking, thus increasing exposure to the toxins in cigarette smoke.<sup>73</sup> I have also found that most smokers are unaware of the problem of filter contaminants coming loose and being ingested and/or inhaled by the smoker during the act of smoking.<sup>74 75 76 77 78 79</sup>

8.6 Despite overwhelming evidence about the harmful effects of smoking, many smokers I speak with rationalize their smoking behavior by telling me that they will stop smoking before they experience any harmful consequences. Slovic found among adults who had been smoking for more than 5 years, 64% planned to stop smoking in the next year.<sup>80</sup> However, the reality is the majority of smokers who attempt to stop will relapse back to smoking.<sup>81</sup> This is more likely to be the case for blue collar smokers

<sup>72</sup>Hoffmann D., Hoffmann I. 1997. The changing cigarette, 1950-1995. *Journal of Toxicology and Environmental Health* 50:307-364.

<sup>73</sup> Kozlowski L et al. Few smokers know their own cigarettes have filter vents. *AJPH*. 1998;88:861-862.

<sup>74</sup>Pauly J, et al. Fibers released from cigarette filters: an additional health risk to the smoker? *Cancer Research* 1995; 55:253-258.

<sup>75</sup>Pauly J et al. Inhaled cellulosic and plastic fibers found in human lung tissue. *Cancer Epidemiology, Biomarkers & Prevention*. 1998; 7:419-428.

<sup>76</sup>Pauly J, et al. Release of carbon granules from cigarettes with charcoal filters. *Tobacco Control*. 1997; 6: 33-40.

<sup>77</sup>Farr WK, Revers A. Examination of whole cigarette smoke by light and electron microscopy. New York: The Life Extension Foundation, 1958; pp1-109.

<sup>78</sup>Chehab F., et al. Method of and apparatus for decontamination the exposed surfaces of filter mouthpieces in smokers' products. US Patent number 5,645,087, July 8, 1997.

<sup>79</sup>Hastrup J, et al. Consumers beliefs about the safety of filters. Unpublished, 2000.

<sup>80</sup>Slovic P. Rational actors and rational fools: The influence of affect on judgement and decision making. Paper prepared for the Symposium on The Implications of Psychology for Product Liability held at Roger Williams University School of Law, Bristol, Rhode Island, April 21, 2000.

<sup>81</sup>Hymowitz N, et al. Predictors of smoking cessation in a cohort of adult smokers followed for five years. *Tobacco Control*. 1997; 6(suppl: 2):S57-S62.

compared to smokers in other occupational groups because blue collar smokers smoke more heavily and thus have a more difficult time stopping smoking permanently.

- 8.7 A second rationalization for continued smoking I commonly hear expressed by smokers is that *"other things are just as likely (or even more likely) to cause health problems, so why bother to stop smoking."* This fatalistic view of avoiding health problems by stopping smoking is more common among blue collar workers who often feel their occupational exposures make it unlikely that they will gain any health advantage by giving up smoking.<sup>82</sup>
- 8.8 A third rationalization I commonly hear expressed, especially by long term heavy smokers, is that there is no benefit to be gained after years of smoking. Of course, this rationalization is untrue. In fact, because the risk of illness from smoking is greater in heavy smokers the risk reduction benefits of smoking cessation would be expected to be greater for this group.
- 8.9 A fourth rationalization I frequently hear from smokers is: *"If cigarette smoking were as bad as they say, the government would ban them."* Thus, the observation that cigarette are widely available helps smokers rationalize that the health risks can't be too great.
9. Cigarette companies have failed to informed blue collar workers about the risks of smoking.
- 9.1 Cigarette brand advertising and marketing has not informed blue collar smokers that cigarettes are addictive and can cause lung disease.<sup>83</sup> Cigarette companies were aware of research studies showing the joint effect of smoking and asbestos on lung cancer death rates.<sup>84</sup> Cigarette companies have never informed blue collar smokers that because of possible occupational exposure to asbestos or other workplace hazards

<sup>82</sup>Fingerhut Grandados Opinion Research. Report on the findings of the occupational safety and health survey conducted on asbestos-related cancer. March 21, 1983

<sup>83</sup>For examples see Pollay slide collection.

<sup>84</sup>For example see: June 8, 1979 Memo from Fed Panzer to Horace Kornegay. Asbestos situation report. Bates: TIMIN 0067100. Also, see: July 12, 1980 report by PH Lee entitled Asbestos and Cigarette Smoking: A Review of two recent papers by Hammond, Selikoff, and Seidman. Bates: 2060545140.

they are at higher risk of developing lung disease because of their smoking.<sup>85</sup>

- 9.2 Cigarette companies had the ability to direct educational messages about the joint effects of smoking and asbestos on lung disease to asbestos exposed workers as evidenced by their ability to direct cigarette brand advertising to different segments of the population including blue collar workers.<sup>86</sup>

- 9.3 Not only have cigarette companies not informed blue collar workers about the health risks of smoking, they have publicly denied that cigarette smoking is a cause of lung disease while at the same time making claims that cigarette smoking is not injurious to health. For example, the "Frank Statement" advertisement published jointly by major cigarette manufacturers in hundreds of U.S. newspapers in 1954 stated:

*"We believe the products we make are not injurious to health."*<sup>87</sup>

In 1954, George Weissman, Vice-President of Philip Morris, stated that:

*"If we had any thought or knowledge that in any way we were selling a product harmful to consumers, we would stop business tomorrow."*<sup>88</sup>

A similar reassuring statement was issued by Lorillard in 1954:

*"We believe Lorillard products are not injurious to any one's health, but we accept as an inherent responsibility our responsibility of our corporate citizenship the obligation to make the public's health our business."*<sup>89</sup>

A 1963 letter to an elementary school teacher from RJR declared that: *".... medical*

*"I have found no evidence among the thousands of tobacco industry documents that I have reviewed that demonstrate that cigarette manufacturers ever informed claimants of the Mansville Trust about the risks of smoking and increased risk of smoking and asbestos exposure.*

<sup>85</sup>See section 5 of this report.

The Frank Statement to Cigarette Smokers. Bates 03046592.

<sup>88</sup>Weissman G. Public relations and cigarette marketing. March 30, 1954 Bates 002366396-002366402. Also see: Weissman G. Facts versus Fancy. February 26, 1954 Bates: 002366389-002366397.

<sup>89</sup>P. Lorillard Company Annual Report, 1953. 93224668.



science has been unable to establish that smoking has a direct causal link with any human disease." <sup>90</sup> Nearly the identical statement can be found in similar letter to a 4<sup>th</sup> grade school teacher in 1972: ".... medical science has not found any conclusive evidence that an element in tobacco or tobacco smoke causes any human disease" <sup>91</sup>, and to an elementary school principal in 1990:

"....the simple and unfortunate fact is that scientists do not know the cause or causes of the chronic diseases reported to be associated with smoking." <sup>92</sup>

A 1969 advertisement from American Tobacco Company responding to a news article about the health risks of cigarette smoking assured consumers that as far as the American Tobacco Company was concerned:

"No scientist has produced clinical or biological proof that cigarettes cause the diseases they are accused of causing....we are not going to knuckle under to the Times [New York Times] or anyone else who tries to force us to accept a theory which, in the opinion of men who should know, is half-baked." <sup>93</sup>

In a 1972 Wall Street Journal article, James Bowling, VP for Philip Morris was quoted as saying...:

"If our product is harmful...we'll stop making it. We now know enough that we can take anything out of our product, but we don't know what ingredients to take out." <sup>94</sup>

A 1978 pamphlet from Philip Morris states:

"Cigarettes have never been proven to be unsafe." <sup>95</sup>

<sup>90</sup>Mann JB. 5/1/63. Bates: 9445.

<sup>91</sup>Cahill TK. 4/7/72. Bates 5006701.

<sup>92</sup>Spach JF. 1/11/90. Bates:2599.

<sup>93</sup>Advertisement in the New York Times entitled, "Why We're Dropping the New York Times" (9/8/69) Bates: ATX040303547-ATX040303550.

<sup>94</sup>Kwitny Jonathan. Defending the Weed: How embattled group uses tact, calculation to blunt its opposition. The Wall Street Journal, January 24, 1972 Bates: 50032 4162.

<sup>95</sup>Facts about Smoking Controversy. 1978; Bates: TIMN0055129-TIMN0055135.

In 1984, an RJR advertisement said:

*"It has been stated so often that smoking causes cancer, it's no wonder most people believe this is an established fact. But, in fact, it is nothing of the kind. The truth is that almost three decades of research have failed to produce scientific proof for this claim...in our opinion, the issue of smoking and lung cancer is not a closed case. It's an open controversy."*<sup>96</sup>

On February 2, 1984, the chairman of the board of RJR made the following comments as part of a panel discussion on the Nightline Television program:

*"It is not known whether cigarettes cause cancer."*

*"Despite all the research to date, there has been no causal link established [between smoking and emphysema]."*

*"...as a matter of fact, there are studies that while we are accused of being associated with heart disease, there have been studies conducted over ten years that would say, again, that science is still puzzled over these forces."*<sup>97</sup>

10. Educating blue collar workers about the health risks of smoking and benefits of smoking cessation influences smoking behavior

- 10.1 Changes in both smoking initiation and smoking cessation over the past half century reflect the impact of increasing public awareness about the dangers of cigarette smoking.<sup>98 99</sup> Both smoking initiation rates and cessations rates have declined since the 1950's. However, changes in smoking behavior seen over the last half century have not been uniform among all occupational groups. Trend data show that the gap in smoking prevalence between blue collar and white collar workers has widened over the past 20 years. In 1978-80, blue collar workers were 38% more likely to smoke cigarettes than white collar workers; by 1997 blue collar workers were 75% more

<sup>96</sup>Can we have an open debate about smoking? 1/30/84. Bates: TICT 0008934.

<sup>97</sup>ABC News. Nightline - EDB & Smoking Debates, February 2, 1984. Bates 20364.

<sup>98</sup>1989 Surgeon General's Report on Smoking and Health.

<sup>99</sup>Warner KE. Effects of the anti-smoking campaign: An update. AJP 1989; 79: 144-151.

likely to smoke than white collar workers.<sup>100</sup>

10.2 Access to information about the risks of smoking appears to key factor in explaining differences in smoking trends between occupational groups. For example, physicians have shown a marked decline in cigarette smoking prevalence over the last half century.<sup>101 102 103</sup> Physicians would be expected to have had much greater access to full and complete health information about the risks of cigarette smoking and the benefits of smoking cessation. The widening gap in cigarette smoking prevalence seen over the past 20 years between blue collar and white collar smokers is consistent with the observation that blue collar smokers are less well informed about the risks of smoking and benefits of smoking cessation.

10.3 Education programs that reduce the knowledge gap between white collar and blue collar workers can reduce differences in smoking behavior. The COMMIT study demonstrated that education about smoking can increase quit rates in a population.<sup>104</sup> The COMMIT education program was successful in significantly boosting quit rates by 1.8% overall. The COMMIT education program was found to be most effective in increasing cessation rates in those with less years of formal education (i.e., non-college graduates).<sup>105</sup>

10.5 My professional experience in working with thousands of smokers over the past 20 years coupled with findings of published research supports the view that smokers are

<sup>100</sup>Giovino GA, Peterson LL, Trosclair A. The prevalence of selected cigarette smoking behavior by occupational class in the United States. Draft report 7/20/00.

<sup>101</sup>Nelson DE, et al. Trends in cigarette smoking among US physicians and nurses. JAMA, 1994; 271:1273-1275.

<sup>102</sup>Buechner JS, et al. Cigarette smoking behavior among Rhode Island Physicians, 1963-83. AJPH 1986; 76: 285-286.

<sup>103</sup>Garfinkel L Cigarette smoking among physicians and other health professionals, 1959-1972. CA-A Cancer Journal of Clinicians. 1976; 26:373-375.

<sup>104</sup>The COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): I. Cohort results from a four year community intervention. AJPH 1995; 85:183-192.

<sup>105</sup>The COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): I. Cohort results from a four year community intervention. AJPH 1995; 85:183-192.

interested in receiving information on the risks of smoking and benefits of smoking cessation and will respond to the provision of such information...<sup>106 107 108 109 110 111 112</sup>  
113 114

- 10.6 As an expert in public health education and as someone who has designed and evaluated anti-smoking education campaigns for different target audiences, it is my opinion that the failure of cigarette companies to warn asbestos exposed workers about the increased risk of lung disease resulting from the joint effects of cigarette

<sup>106</sup> Abt Associates. Independent Evaluation of the Massachusetts Tobacco Control Program: Fifth Annual Report: January 1994 to June 1998. Massachusetts Department of Public Health, 1999; also see: CDC. Cigarette smoking before and after an excise tax increase and anti-smoking campaign - Massachusetts 1990-1996. MMWR 1996; 45:960-970.

<sup>107</sup> Pierce et al. Tobacco Control in California: Who's Winning the War? An Evaluation of the Tobacco Control Program, 1989-1996. La Jolla, California: University of California, San Diego, 1998; also see: Pierce et al. Has the California tobacco control program reduced smoking? JAMA 1999; 280:893-899.

<sup>108</sup> CDC. Best Practices for Comprehensive Tobacco Control Programs - August 1999. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, August 1999.

<sup>109</sup> U.S. Department of Health and Human Services. Reducing Tobacco Use: A Report of the Surgeon General. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2000.

<sup>110</sup> The COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): I. Cohort results from a four year community intervention. AJPH 1995; 85:183-192.

<sup>111</sup> Kozlowski LT et al. Smoker reactions to a "radio message" that light cigarettes are as dangerous as regular cigarettes. Nicotine & Tobacco Research 1999; 1:67-76.

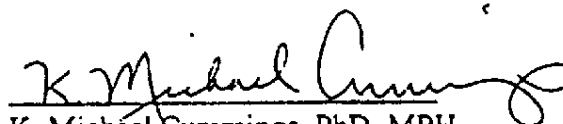
<sup>112</sup> Cummings KM, Sciandra R, Markello S. Impact of a newspaper mediated quit smoking program. AJPH 1987; 77:1452-1453.

<sup>113</sup> Cummings KM. Community-wide interventions for tobacco control. Nicotine & Tobacco Research 1999; 1:S113-S116.

<sup>114</sup> Hastrup J, et al. Consumers beliefs about the safety of filters. Unpublished, 2000.

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smoking and asbestos contributed to higher smoking rates, more frequent daily smoking, and lower rates of smoking cessation in this group of workers than would have otherwise been the case had these workers been warned about the joint risks of smoking and asbestos as a cause of lung disease.

  
K. Michael Cummings, PhD, MPH